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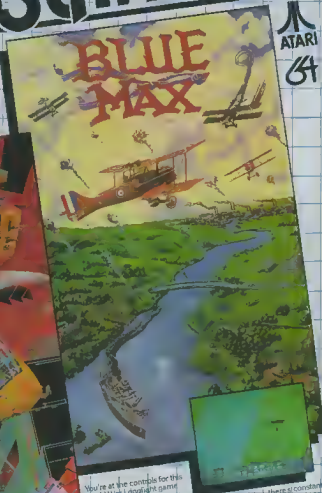
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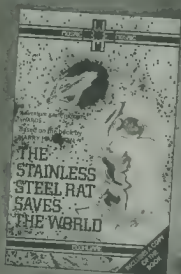
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Registered Offices:
Praxy Court
30-32 Farringdon Lane
London EC1R 3AU
1984 An EMAP Publication

Editorial and Advertising
01 251 8223
Subscription Back Issues
0728 351215

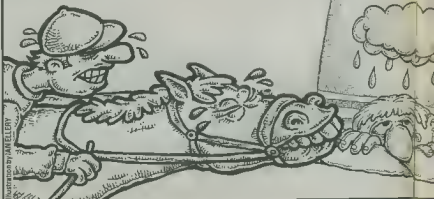


Illustration by JANE ELLERY

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Screen Scene

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Vic Adventure Round-Up

Thinking of getting an adventure for your Vic? Then read our round-up first. Amongst the games reviewed are Zak's Kingdom, Sword of Mkalot, Tomb of Drowan, the Wizard and the Princess and dozens of others. Compulsory reading for Vic adventurers.



Virtuals

Games and utilities more listings for your Commodore than any other magazine.

Books

We review the Complete Commodore book, and learning by Screen Shots.



Home Control

Part four of our series teaching you to use your computer to run your home.

Printer Plotter

We show you how to get the most out of Commodore's £100 printer. Our feature includes a listing to enable you to use the Printer Plotter to chart your own biorhythm.



Define Your Own

A simple way to define your own characters.

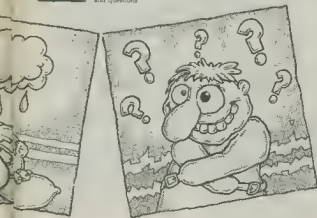
Letters

The last you write.



Tommys Tips

Our Commodore Surgery dealing with a host of your problems and questions.



New ways to plot

Datafax has announced a new colour printer/plotter costing a remarkably low £180. But can you use it with your Commodore computer? The answer, as usual, is that you'll need an interface adaptor, as the Sakata SCP-800, as it's ponderously called, has only a Centronics parallel interface. A fairly cheap adaptor may suffice because you'll probably get away with buying a cheap adaptor since you won't be able to produce Commodore's unique graphics. Not even the Commodore 1380 (reviewed this issue) can do that. Still, the price and facilities look like making it a better buy than the 1380.

The Sakata can use paper up to A4 in size, both single-sheet and fed from a roll. It uses 4 colour ball-pens (identical to the 1380's) and, like the 1380, has a range of four character sizes for printing. Print speed for the smallest size is 12 characters per second, deteriorating to 6 per second for the largest.

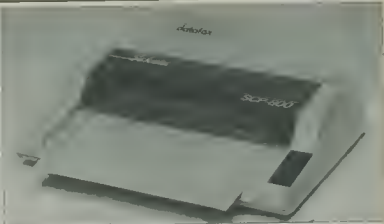
The plot mechanism is done on an x-y basis with a speed of 87 mm per second across both axes and 81 mm per second travelling diagonally. Accuracy of movement is 0.3 mm maximum. Datafax claims that felt-tip pens will soon be available to allow plotting on an acetate surface for overhead projection. Also being developed is screen-dump software for the Commodore 64. More details on 0296 464187.

Commodore goes Top of the Form

It's no secret that one of Commodore's ambitions is to make an increasingly large impact on computing in British schools, where the 386 micro still has a virtual monopoly. As part of its "educational offer" for next year, Commodore has announced that it is to sponsor the 1988 British Computer Society's Computer Quiz.

Similar to TV's Top of the Form programme the quiz invites schools to produce a team of three children by November (one under 17, one under 16 and a third under 15 years of age) to enter regional heats in which a quiz master bombards each team of boffins with a series of group and individual questions (no conferring, please).

Forty branch finalists go on to compete in eight regional finals who in turn go on to the national final, scheduled for July of next



The Sakata SCP-800 Colour Plotter/printer from Datafax

year. Schools will be invited to host rounds of the quiz on their own premises.

What about the prizes? Branch winners will receive a Commodore 64 modem, regional finalists get a Commodore 64 and disk drive each, and the overall winning school will receive £1,600 worth of Commodore computers and peripherals.

If the competition doesn't whet school's appetites for Commodore computers, Commodore is also running a hardware loan and sponsorship scheme: and that's open whether you take part in the quiz or not. Schools are offered free 64 systems on a three-month loan basis, the idea being that they'll be tempted to keep the equipment. For every £7 raised by the school, Commodore matches it with £3 - sounds like a good idea. More details on 01-637 0471.

Clubbing it for repairs

A new organisation, the Micro Repair Club, has been set up to offer a Repair Package to home computer users when their manufacturer's warranty runs out - for Commodore 64 and Vic-20 owners, that means after one year.

It's quite a simple scheme (surprising it wasn't thought up earlier): you pay an annual subscription fee which guarantees free breakdown repair for your computer. Prices are £24.95 for the first year, with a subsequent renewal fee of £14.95. A four-year cover package deal would cost you £97.95.

So how does it work? The Club itself merely acts as the middleman between an insurance company (Domestic and General Insurance) and a repair company. You simply package up your ailing micro and send it to Computaraid, an independent maintenance company belonging to Thorn EMI. That company undertakes to do repairs free of charge within a week - but there are no written guarantees. If the company can maintain this level of service, users may find it an attractive alternative to paid repairs done by Commodore itself, which aims to return goods within two weeks.

At present, you cannot claim free repairs for breakdown caused by accidental damage. Only breakdown caused by faulty mechanical or electrical parts is covered. The Club claims it's working on this and shortly hopes to offer a supplementary policy to cover accidental damage, fire and theft. Similarly, MRC intends to extend cover to peripherals like printers, disk drives and datasets - at extra cost.

MRC is not surprisingly eager to push its service in schools, a particularly fertile area for micros, offering a deal of £24.95 per year for the first machine and £19.95 each year for the rest.

Computer retailers are also being encouraged to offer the service to buyers on a commission basis. According to Simon Jamson, MRC's general manager, "offering membership is another selling point that is bound to sway the potential customer". Funny, with Commodore behind you for the first year, why look elsewhere for a repair service? More details from MRC on 01-946 7777.

SHORTS

Bridging the language barrier: Dunstable software house Kosmos, has just released Commodore 64 versions of its German Master, French Mistress and Spanish Tutor language learning programs. Each language is covered by two cassettes (levels A and B) which provide a learning aid for foreign words, phrases and verbs. Cassettes cost £8.95 each. More details on 05253 3943.

SHORTS

The 64 from Waterloo: W H Smith is opening its first Computer Shop inside London's busy Waterloo Station and, of course, you'll be able to buy the Commodore 64 and 16 models there. This sounds like a smart move since an estimated 180,000 travellers pass through the station each day. So if you've got a long wait for a train, what else can you do but buy a computer?

SHORTS

Calling radio hams: We'll be running an exciting new series for radio hams early next year. We'd like to hear from any Amateur Radio Society or Club which uses the Vic-40 and Commodore 64. Why not drop us a line? We'd be really interested to hear from you.

SHORTS

Musical discount: Musical UK, distributor of the Musical synthesiser package for the Commodore 64 (reviewed last month) is to give a 15 per cent discount to Users Groups buying five or more copies, and will top a hefty 20 per cent off for orders of more than twenty. Sounds good - so does the package. More details on 01-241 2354.



Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



COMMODORE MPS801
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COMMODORE MPS802
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18 characters per second



COMMODORE 1520
Printer/plotter £769.99. For
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COMMODORE 1541
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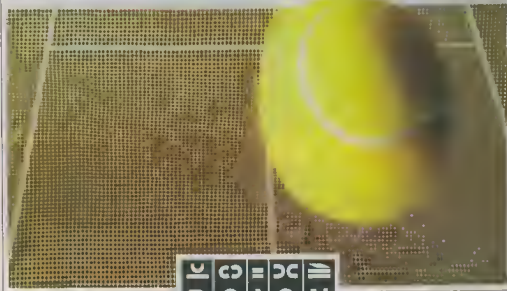
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Christmas Cards from Compunet

If you're one of the new breed of computer artists eager to find an opening for your work, Compunet may be what you're looking for. The Commodore viewdata company is running a Christmas Card design competition. If you're a Compunet subscriber, you use the modem's edit facility to design an on-screen card, which you then upload to Compunet's mainframe.

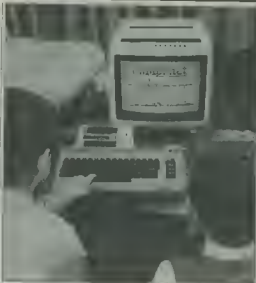
The winning design gets £25 and will be included in Compunet's stock of 'Christmas Cards' for subscribers to download. The idea is that you choose a card (usually you're choosing a six-pack costing around 80p, write your message on it using the edit facility, and then 'mail' it to a fellow subscriber. Who needs stamps?

Compunet has another competition to produce the most original frame to introduce one of the viewdata services - there are so many you'll have to check out one of Compunet's advertisements to find one to suit your talents. The winning entry this time gets a Commodore 120 colour monitor (runners-up get £25).

If you're not a Compunet subscriber, or don't have access to it, there's still hope. According to Compunet's John Clarke, "non-subscribers will be able to enter the competition by producing their display inside a Basic program and sending it to us either on tape or disk". But you're limited to the Commodore character set and the display must be 23 lines long.

Compunet uses the 24th line for text. Entries should be sent to Compunet at Metford House, 15 Cliphurst Street, London W1P 7DF.

Can you do better than this?



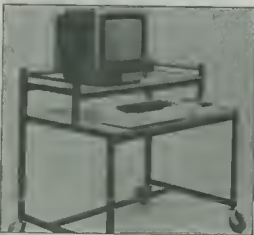
The first nationwide interactive 'electronic marketplace' for Commodore 64 users

SHORTS

Keala adds value: Audiogenic is bundling two more software utilities into its Keala Pad graphics tablet for the Commodore 64. The first, called Kealapainter, lets you print out on-screen graphics you've created via a Commodore dot matrix printer. But you'll still need an interface adaptor to use a non-Commodore model. Keala Instant Programmer's Guide, the second package, is a set of programs that describe how you can use Keala Pad as an input device in your own programs.

According to Audiogenic, those extra programs are fully documented in the new instructional manual. Keala Pad has now been customised for the UK, providing software to conform with the British PAL TV standard as opposed to NTSC,

used in America where the device is made. What all that means, is that circles really do look like circles. Kealapad costs £79.95 and includes software on both tape and disk.



If keeping your computer hardware on the kitchen table causes domestic friction, this mobile computer trolley from EME might be the answer. Originally designed for the educational market, it's sturdily built from tubular steel, with Formica-coated (laminated) shelves. You also have a choice of two heights: 840mm and 860mm. The price? Well, it doesn't come cheap, but models cost around £55 (plus VAT). More details on 0494 86504.

SHORTS

Mastertronic disks: Several of Mastertronic's games are now being made available on disk. And keeping up its bargain-basement tradition, they'll sell for £3.99 each. Titles now available are BMX Racers, Space Walk, Orbitor, Squirm, Duck Shoot and Vegas Jackpot, not forgetting their latest offering, Chiller. As consolation for the tape bound, all future Mastertronic cassette games will feature its 'burner loading' fast loader.

SHORTS

Basic on video: Most people teach themselves programming with a book. But since we're in the Video Age, it's not surprising that a company should come along with a tutorial videotape. The company is Hobby Brothers with a range called Masterclass. Two tapes are available (for both Vic and 64) which take you from the first steps, to advanced programming in Basic. Each tape includes examples of Basic programs on its audio track which you can load into your machine (through a somewhat tortuous route). The tapes cost £19.95 each and are available in both VHS and Betamax formats. More details on 091 437 0538.

CHRISTMAS S

THE CHEETAH RAT



Look Mum no wires – a new remote control joystick for the Vic and 64 will relegate traditional joysticks to their rightful place in the Science Museum say its manufacturers – Cheetah Marketing.

The Rat is an infra-red action transmitter that works in conjunction with a receiver that plugs into the control port two receiver at the side of the 64. This has been styled in the same colours as the 64 to make the whole thing look neat.

The joystick itself uses a disk controller for direction and is also capable of rapid fire. It requires a PP3 battery and will fit easily into the palm of your hand.

Cheetah claim that the Rat is the fastest controller yet produced for the 64. It can be used up to thirty feet away and has the advantage of letting the player play the game at a good safe distance from the screen.

The Rat is compatible with all existing Commodore software and can also be made to work with your own programs.

You can purchase the Rat from specialist computer shops at £29.95. This could make a good present from mothers who are fed up with joystick leads worming their way around the living room.

Christmas time is present time and for many a computer owner that means receiving a useless peripheral that is totally incompatible with your system.

Worsa still are tha smaller gifts of software packages that you have either already got or do not want.

To give you soma idea of the more interesting add-ons and software packages we have drawn up a list.

To get the best results from our Xmas shopping list leave your Commodore User open at this paga on the coffee table.

Bettar still read it in front of your target and occasionally mutter something like "Hmm thats interesting", or "thats useful" – if they still don't get the hint you may as wall just come right out and say "I wouldn't be too upset if someone bought me one of these for Christmas".

PRINT 'N' PLOTTER ADVENTURE PLANNER

Adventure freaks can now make use of a clever adventure solving aid to help them work their way out of the stickiest of situations.

One of the most difficult parts of adventuring is trying to work out where you are at any given time.

Its all very well being a great lateral thinker and solving problems instantly. But if you don't know where the problem is taking you in relation to where you have just been then you are as lost as the next person.

Dungeon-scarred adventurers have long been aware of this problem and have mapped their every move on

HOPPING LIST

TOUCHMASTER FAMILY FUN

The Touchmaster is the latest of the direct-entry devices launched for the 64 that enables you to put graphics on-screen without using the keyboard.

Prutec, the company behind Touchmaster believe that many people are put off using their computer because of a resistance to the keyboard. This belief is backed up by a great deal of research currently being conducted in Japan, America, and the UK into the so-called "fifth generation" of computers which will use speech and touch to communicate with the computer.

Touchmaster has a pressure-sensitive A4 work surface and a resolution of 256 x 256. There are no moving switches or dials - graphics are simply painted on screen using the software package and overlay that comes in the box.

Prutec believe the Touchmaster will have many applications outside the home "Commercial and industrial applications for this technology only await the software."

Touchmaster will have its own range of software specially written to run with the system. The first of these will

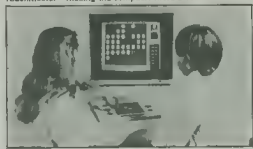
be graphics packages enabling the user to create designs using pre-programmed shapes, board games, arcade games, and adventure games and utilities such as sound synthesisers and graphics editors.

It's likely that the best immediate application of Touchmaster will be in education - particularly for pre-school age children who will benefit from bright overlays and specially written software.

Touchmaster is just one of a number of graphics tablets currently on sale. It is on sale at a slight pricey £149.95.

Other similar graphics tablets are the Super Sketch from Stonechip, Grafpad from British Micro, and Koala Pad from Audiogenic.

Touchmaster - making the computer more accessible



graph paper. Every book on adventure includes the obligatory chapter on mapping.

The Print 'n' Plotter Adventure Planner comprises fifty pages of A3 - that's Daily Mirror size - to plan, and

keep a permanent record of the game so far to avoid repeating mistakes and following paths that you have already discovered lead to nowhere.

Each of the fifty pages contains a mapping system with over 150 locations and comes complete with examples and hints and tips on the art of mapping.

The Planner can also be used by people who prefer to write their own adventures to pre-plan the locations.

The Planner is available from specialist computer shops at £3.95 or by mail order at £4.50 inclusive from Print 'n' Plotter Products Ltd, 19 Borough High Street, London, SE1 9SE.

CHRISTMAS SHOPPING LIST

COMMODORE'S MAKING MUSIC

The Christmas tradition of all the family sitting around the piano singing festive songs is about to get a computerised boost thanks to the latest add-on from Commodore for the 64.

You can now sit your family around the 64 and let the computer's three sound channels produce the melodies.

The Music Maker consists of software, a twenty-eight page book of popular songs and tutorial material and a 24 key piano-style keyboard which fits over the 64's keyboard.

The software has eight built-in voices which simulate instruments such as the guitar, piano and synthesizer but all the parameters of each sound can be altered to create almost any sound within the capability of the Commodore 64.

A number of different modes can be selected from the menu including one which creates a range of rhythms from Waltzes to disco, with pre-programmed bass patterns, around which a tune can be created.

For the complete novice tunes can be copied out of the book into the computer. These can then be played back from memory reproducing the key strokes on screen as the tune plays.

Commodore are confident that the Music Maker's £29.95 price tag will make a real winner in the Christmas present market. "The combination of keyboard, software and book will unleash the full music potential of the Commodore 64 for the first time" says the sales blurb.



OLD FOGEYS

Old fogeys have been having a lean time of it recently with all the publicity going to their younger counterparts.

Commodore are determined to redress this balance and have signed up two leading old fogeys to promote their new graphics software utilities.

Tony Hart, old fogey extraordinaire, and presenter of the BBC's 'Vision On' and 'Take Hart' endorses the new Art Master package.

"I was impressed by Artmaster because you don't have to be a computer expert to produce pictures".

Old fogey number two, Rolf Harris, beams out from the box of the Picture Builder which is aimed at a younger age group than the Tony Hart package.

The picture builder enables the user to build on existing graphic characters stored in software.

The utilities are available on disk or cassette at £11.99. Could make a good present for old fogey lovers everywhere.

The silly book business is one of the few booming areas of British publishing, having spawned a host of best-sellers in the last few years.

Not surprisingly the computer book publishers are now jumping on this bandwagon. Well, when you've published a hundred books on the 64 disk drive you kind of run out of things to say about it.

First of the loony computer books is Computer Wimp by John Bear which contains essential information on "computerbabble" – or how to talk to computer people and "Why you need never learn programming". A giggle at £6.95.

Even more looney is the recently published 101 Things To Do With A Dead Computer – suggestions range from yanking the keys out and using it to make ice, growing plants in it, or using it to grate cheese. A few cartoon laughs at £1.95 – more of a stocking-filler than a main present.

Interview

Opportunity Knocks.

This is your big chance — the top programmer's job. All you have to do is be at the right place at the right time.

But don't be deceived, the competition is tough out there!

Due to the complexity of creating graphics and sound for a challenging game play, Interview is a multi-load game using the Novaload fast load system on tape.

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Review

Write your own BLOCKBUSTER

Are 'games designer' programs all they're made out to be?

Sooner or later, most Basic programmers are going to try their hand at writing a game. Why not – they've all done it, why can't you? But for the less than obsessive enthusiast, that's a tall order. So a games designer package like Scope, The Quill or Mirrorsoft's Games Creator might be an attractive answer, especially if it lets you off learning machine code. Roger Jones, himself a professional programmer, looks at all three and finds out whether they'll help him make a million – or at least a few bob.

by Roger Jones

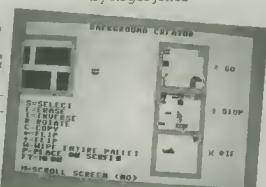
Games designers fall into two main groups, adventure and arcade, but the arcade designers have to be split into two sub-categories, re-designers and pseudo-assemblers. In this article I am going to take an example of each of these and compare their merits and disadvantages.

Scope for design

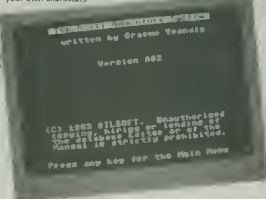
Taking the last type first, one of the best pseudo-assemblers currently available for the Commodore 64 is Scope from Codewriter Limited. Scope is an entirely new language dedicated solely to the purpose of games writing. It enables you to construct machine code routines (or at least something like them) which can be run from within a Basic program. It uses Basic-like commands to write the routines and then compiles them into its machine code.

Scope comes in a nice presentation box complete with a comprehensive and fairly easy to read manual which takes you step by step through the 46 command words which make up its language. These command words have to be entered in basic REM statements and the completed Scope routine is then compiled into an area of high memory reserved for it by the main program. Completed routines can be saved to tape for later use with the tape drive program included with the package.

Scope is intended for the rapid execution of sub-routines in a Basic program and as such can handle graphics, sprites, colour,



Games Creator – design your own characters



The Quill – most successful games designer

sound effects, music and animation but herein lies its weakness as a 'designer'. It is not the sort of thing that a programmer with only a smattering of Basic could hope to pick up and create those elusive moneymakers with straight away.

In use Scope is as complicated as Basic and a good knowledge of program structure is necessary before any results can be achieved. There is no provision for multi-statement lines so things tend to be very long and narrow and the interminable printing of REM after every line number is tedious to say the least. The demonstration programs included on the reverse of the tape show some of the capabilities of this undoubtedly powerful language but that is what it is, a language, and it's not that easy to learn.

At £17.95 it is neither cheap, nor, for what it is, expensive. When I have more time maybe I will learn to speak Scope, but then I might just as well learn machine code itself.

Mirrorsoft's Games Creator

Working with arcade designers for the moment, the other sub-category is the re-designer.

There have been a number of home-produced re-designers around for some time for the Spectrum which allow you to chop Jeri Set Withe and company to bits and put them back together in a different shape.

Now from Mirrorsoft comes Games Creator for the

Commodore 64. It only that was what it was. When I first heard about it, I thought my quest for a way to write that blockbusting arcade game was at an end, but oh dear me, it was not to be.

For all that, though, Games Creator is still a very good program in its own right. More pretty packaging contains the manual and single tape which is a fast loader. The manual is written, I feel, to appeal to younger enthusiasts and takes you step by step through the program's capabilities.

But within seconds of reading it I thought, came the bitter disappointment. Games Creator is not capable of producing games that will run without the presence of the main program in memory.

The tape loads rather unusually; it makes the 64 behave like a Spectrum and you are presented with a title screen whilst the loading takes place complete with multi-coloured flashing lines surrounding it. Very clever, I wish I knew how they did that.

When loading is complete you see a menu page allowing access to the various options for re-designing the game currently in memory. It automatically loads one sample game with the main program and there are two more on the reverse of the tape. These games are of the platform, maze and good old shoot 'em up types and any one of them can be changed in the minutest of detail.

A la carte options

The menu options allow you to alter the sprites, background, music, sound effects and the rules governing the actions of the player and his opponents or aliens (as the authors describe them). The background can be scrolled or static, but as far as I can tell it cannot be changed within a game to a new scene even when moving to a new level.

The system for designing the scenery is a little complicated at first glance but very versatile once you've got the hang of it. The music menu is absolutely first class, allowing you to write quite lengthy tunes simply by putting the right note on to the correct staff. Only one minor gripe here, no sharps or flats, which made my version of *Bridge over Troubled Water* sound a bit off in places.

The whole thing can be driven almost completely with the joystick making it easy to use for the little 'uns, but is sophisticated enough to keep us older folks

amused as well. Your completed masterpiece can be saved to amuse and astound your friends when they come round, but why oh why couldn't they have gone just that little bit further and make them run on their own?

As it stands, though, it is a very interesting piece of software and, I think, well worth the price tag of \$12.95. Microsoft themselves are prepared to buy original Games Creator supported games, with the intention of offering them to owners of the main package, but I somehow feel that this defeats the idea of the program.

Adventuring with The Quill

Now, at last, to the real gem in the list of runners. This next program falls into the adventure game category. It's called *The Quill* from Gilsot and it is, at last, a true text adventure designer in that it produces a stand alone game (one that doesn't require the host program to be loaded first) of marketable quality without the need for specialist programming knowledge.

The Quill comes in an unprepossessing black and gold package which belies the excellence of its contents. The program is on a single tape and is supported by an easy to read, two-part manual.

The first part takes you through the construction of a very simple adventure which, if followed carefully, will teach you enough about the program to enable you to tackle the first steps of writing your own adventure game. The second part is a detailed description of the editor, interpreter and database that make up *The Quill*, forming a clear and concise reference for the serious user.

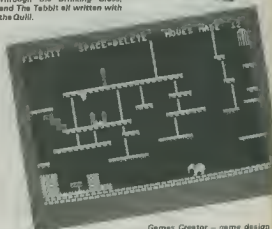
Load and run

On loading the program you see a very complete menu arranged in order of entry, and it's a good idea to have worked your game out on paper first so that the majority of entries can be inserted in this order. Further additions can be made later but it is important to stick to the order of entry as, for example the interpreter cannot recognise a word if it's not already in the vocabulary.

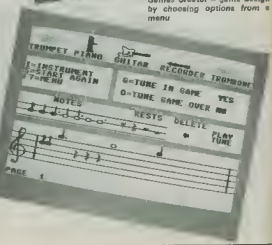
I've found that *The Quill* can be made to go beyond the limits



The Quill - Hampstead, Dennis Through the Drinking Glass, and The Tabbit all written with the Quill.



Games Creator - game design by choosing options from a menu



GAMES CREATOR

MIRROSOFT

by David and Richard Davies

stated in the manual. Although it is a text-only game designer, you can for example access some of the Commodore's graphics (by using the CEM key) and with careful use of colours reversed spaces and letters you can build some very pretty screens and limited figures.

Playing around with the interpreter in the 'event' and 'status' tables can make some seemingly impossible things happen - such as causing secondary characters in your game to appear in locations other than that occupied by your main character. It is even possible to cause an almost random sequence of events to occur by combining the chance feature with one of the move counting flags.

Your game can be saved to tape at any time as a database, which allows you to re-load it at a later date into The Quill for further work, or as a completed adventure for distribution among your friends or even for sale.

I've been using The Quill for some time now and I market the results. Very generously, the authors of The Quill do not mind you doing this - asking only that you mention their program in your own.

In my opinion, The Quill is one of the most amazing programs I have come across. It does all the tedious stuff for it and a bit more. It takes the hammer and chisel work out of adventure game writing and leaves you to tackle the more important job of producing a logical and demanding result.

This is not to say that it is easy. The amount of work that goes into producing a respectable sized and reasonably presented adventure game is still, to say the least, prodigious. But The Quill frees you from the confines of Basic and allows your imagination to run free. I cannot praise it highly enough, and at £14.95 it is cheap. Very cheap!

Conclusions

There are, of course, other utilities dedicated to the art of computer games writing and chief among these for the Commodore 64 must be sprite designers Pro Sprites from Dooah and Mirrosoft's *Go Sprites* are good examples of these, allowing on screen building and animation of sprites and the compilation of a 'sprite' library. The data statements for the sprites thus created can be extracted for later use in your own programs. But there is no way these can be called games designers and the authors do not claim them to be so.

Still, some software producers allow their advertising to get the better of them. For example, the blurb on the cover of *Scapes* claims it to be 'THE games designer'. Unfortunately it is not. It's a very good and powerful language dedicated to the writing of arcade style games. So why don't they say so - it's nothing to be ashamed of! I'm not knocking the product, just the fact that it is not really what it is claimed to be.

The same can be said for Mirrosoft's Games Creator. 'The Games Creator is all you need to make your own complete and unique games' claims the advertising. But it won't: there is no way a list of data statements can be called a complete game. Games Creator is a very clever user re-designable game, a sort of mecano set of the computer. It can be assembled and re-assembled time and time again, but in the end it is still mecano.

Of the three main utilities reviewed here only The Quill is a true games designer. Of course it only produces adventure games, but then that is what it was designed to be. Now if someone could combine the brilliant graphics capabilities of Games Creator with the excellence of The Quill we would really be getting somewhere...



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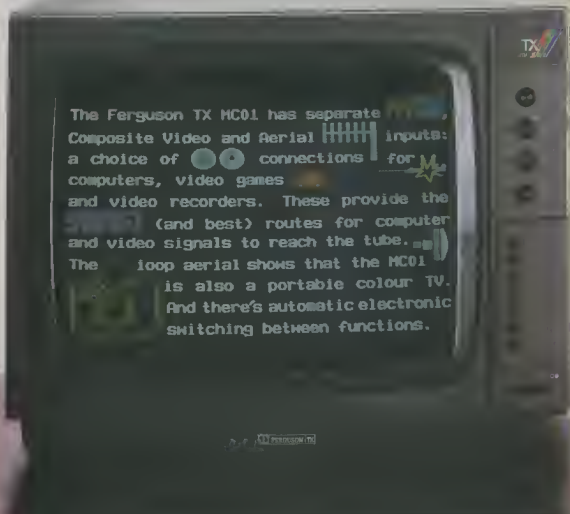
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	TITLE	Publisher	Computer
1	Daley Thompson's Decathlon	Ocean	C64
2	Jet Set Willy	Software Projects	C64
3	Chiller	Mastertronic	C64
4	Beach-Head	Access/US Gold	C64
5	Zaxxon	Access/US Gold	C64
6	Monty Mole	Gremlin Graphics	C64
7	Decathlon	Activision	C64
8	International Soccer	Commodore	C64
9	High Noon	Ocean	C64
10	Summer Games	Quicksilver	C64

	TITLE	Publisher	Computer
11	Spitfire Ace	US Gold	C64
12	Sub Wani	Mastertronic	C64
13	Football Manager	Addictive	C64
14	Quo Vadis	The Edge	C64
15	Strip Poker	US Gold	C64
16	Vathalla	Legend	C64
17	Twix Kingdom Valley	Big-Byte	C64
18	Kokotoni Wolf	Elite	C64
19	Flight Path 737	Anirog	C64
20	Neto Commander	Access	C64

CHART UPDATE

Presenting our new look charts page. Commodore User is now publishing the UK's most accurate Top Thirty Games chart by special arrangement with Computer and Video Games and the Daily Mirror. As well as the mixed Top Thirty we will be publishing the Commodore only Top Twenty.

Both charts have been compiled by NOP - the people behind the opinion polls. Watch out for the Top Thirty on Saturday Super Store and the Daily Mirror.

(Available on)

THIS WEEK	LAST WEEK	WEEKS IN CHART	TITLE	Publisher	Computer	SPECTRUM	COMMODORE 64	ELECTRON	ATARI	DRAGON	ORIC	MSX	OTHER
1	2	5	Daley Thompson's Decathlon	Ocean	Spectrum	*	*						
2	3		Daley Thompson's Decathlon	Ocean	Commodore 64	*	*						
3	4		Elite	Acorn	BBC								
4	4	3	Beach-head	Access/US Gold	Spectrum	*	*						
5	5	17	Jet Set Willy	Software Projects	Spectrum	*	*						
6		1	Combat Lynx	Durel	Spectrum	*	*						
7	8	2	Jet Set Willy	Software Projects	Commodore 64	*	*						
8		1	Avalon	Hewson Consultants	Spectrum	*	*						
9	5	5	Monty Mole	Gremlin Graphics	Spectrum	*	*						
10	11	3	Chiller	Mastertronic	Commodore 64	*	*						
11		1	Pyramarama	Micro-Gen	Spectrum	*	*						
12	13	11	Beach-Head	Access/US Gold	Commodore 64	*	*						
13	13	8	Zaxxon	Access/US Gold	Commodore 64	*	*						
14	7	3	Sherlock Holmes	Melbourne House	Spectrum	*	*						
15	23	5	Monty Mole	Gremlin Graphics	Commodore 64	*	*						
16		1	Decathlon	Activision	Commodore 64	*	*						
17		1	Football Manager	Addictive	Spectrum	*	*						
18	12	3	Kokotoni Wolf	Elite	Spectrum	*	*						
19	23	2	Danger Mouse in Double Trouble	Creative Sparks	Spectrum	*	*						
20	29	2	International Soccer	Commodore	Commodore 64	*	*						
21		1	BMX Racers	Mastertronic	Spectrum	*	*						
22		1	Tin-Ne-Nog	Gargoyle	Spectrum	*	*						
23	9	9	Full Throttle	Micro Mega	Spectrum	*	*						
24		1	Beetle Cars	Games Workshop	Spectrum	*	*						
25		1	High Noon	Ocean	Commodore 64	*	*						
26	10	10	Tornado Low Level	Vortex	Spectrum	*	*						
27		1	Summer Games	Quicksilver	Commodore 64	*	*						
28	15	11	Lords of Midnight	Beyond	Spectrum	*	*						
29		1	Bouncing Bertie	Power	Spectrum	*	*						
30		1	Braxxon Blitz	Micro Mega	Spectrum	*	*						

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Letter from America

Christmas gifts from the USA

Dan Gutman reports

From his office high up above New York's snow-bound Central Park, Dan Gutman wonders what kind of presents we're all going to buy our computers this Christmas. Stuck for a good idea? Read on. This month, Dan looks at a few American offerings for the 64 that would look good in anybody's Christmas stocking — how about a keyboard that features Kermit and Miss Piggy? But to get your hands on any of them, you'll need to send a truckload of dollars across the Atlantic pretty quickly...

So, what's this about Mastertronic snaring 40% of the computer games market over there? Believe it or not, Americans haven't even heard of any company called Mastertronic yet. In fact, the only British software company that's recognizable to us is *Virgin* — and that's only because of *Boy George*. In this age of high technology and telecommunications, it always amazes me how that Atlantic ocean manages to get in the way

Christmas pressies

In the meantime, the old Commodore 64 ain't dead yet. There's a truckload of outrageous peripherals for the machine, and they would make dandy Christmas presents. I'll give you all the addresses of the companies that make them, so you can write away for more information...

● **How about a replacement disk drive?** As we all know, you could sit from old age waiting for Commodore's 1541 to load a program. A company called *Indus* makes replacement drives for the 64, the Apple, and Atari computers. I haven't seen it in action, but they claim the Indus GT is "the most advanced, most handsome disk drive in the world." Just what we need — a handsome disk drive in the world. 1541 by 300% (Datamost, 8943 Fulbright Ave., Chatsworth, California 91311)

By the way, *Datamost* has a new piece of software called "Kwik-Load" which speeds up the 1541 by 300% (Datamost, 8943 Fulbright Ave., Chatsworth, California 91311). Is there something about Chatsworth, California that makes people want to improve on Commodore's disk drives?

● **Okidata** has just released a really impressive color printer for the 64 that can produce more than 40 different shades of color and will print on just about any surface — even acetate. The most impressive thing about the Okidata 10 is the price \$339. American bucks. That's cheaper than just about any other letter-quality or even dot-matrix printer (Okidata, 554 Fellowship Road, Mt. Laurel, New Jersey 08054)

● **Digital Research** has developed a device that will

interface the Commodore 64 and the Pioneer LD700 laserdisc player. It's not on the market yet, but it will be called *Vidlink*, and it's basically a connector cable plus a cassette or disk software program. Most likely, the first programs for *Vidlink* will be games along the lines of the arcade game *Dragon's Lair*. In the U.S., laser games in the arcade made a big splash last year, and then sort of died out quickly. But many folks (including this reporter) believe that the home is where you hang your laser, and we'll be seeing some home laser games in the near future that will revolutionize this whole crazy industry.

● The Commodore 64 is well known for a brain warping SID (Sound Interface Device) chip music. There are plenty of excellent music programs (*Musicaid* and *Musci Construction Set* to name a few), but who wants to play a computer keyboard and pretend it's a piano keyboard? Now there's a real piano keyboard that you just plug into the 64 and the two of them make beautiful music together.

The *Malinda Songbird* is an 18-inch, three octave unit that can reproduce the sounds of up to 16 instruments, including brass, strings and woodwind. It features a built-in metronome, on-screen musical notation, and you can store your music on a floppy disk and play it back any time you like. You can also play a track, play another track on top of it, and play another track on top of that, and then listen to them all playing at once. I heard it, and as we say on these shores, it knocked my socks off. By the way, the president of the company, *Harry Mendell*, has done a lot of work with *Stevie Wonder*, especially on his album "The Secret Life of Plants."

(*Malinda Inc.*, 792 Holmdel Rd., Holmdel, New Jersey 07733).

● Another new keyboard of interest is *Muppet Learning Keys*, from the same people who make the popular *KoalaPad Touch Tablet*. This one is made especially for kids, and it may be the only computer keyboard to feature *Kermit the Frog* and *Miss Piggy*. Instead of having to hunt all over the keyboard for a letter, all the letters in the alphabet and the numbers come through ten are in the right order. The MLK also displays scores of a compass, ruler, eraser and a blackboard on it. Best of all, a kid can smear ketchup, peanut butter, or anything else all over it and the stuff wipes right off. It also comes with some educational software (*Koala Technologies*, 3100 Patrick Henry Drive, Santa Clara, California 95050).

● Last but not least is an offering from *Commodore*. Have you heard *Magic Voice* yet? It's a speech module that can only be described as cool. Light pens and touch tablets are fine, but there's nothing in this world like hearing your computer talk to you in a human-like voice. The *Magic Voice* cartridge plugs into your cartridge port. It has a vocabulary of 235 words, all spoken in a very pure and natural female voice. You can slow the voice down and speed it up, and it won't sound like the *Chupinkies*. Commodore also promises additional speech cartridges that will expand the vocabulary and introduce male voices and children's voices. Right now *Magic Voice* is being used for educational reading games and arcade games like *Goof and Wizard of Wor* ("Ha-ha-ha Space Cadeer"). But eventually, it will be able to read books to blind people and talk for speech-impaired people. It's really amazing.

Commodore Wars

Over here, we're all waiting for Commodore's official introduction of their new Amiga "Lorraine" computer. It will probably be announced at the Las Vegas Consumer Electronics Show in January. There's an interesting aside to this story. As you probably know, Commodore and Atari are long-time rivals in the U.S. since the days when the Vic-20 was battling it out with Atari's 400/800 computer. After that it was the Commodore 64 versus the Atari 800XL. Now that Commodore has purchased Amiga, everybody is wondering what Jack Tramiel and Atari will fight back with...

I just heard a very juicy rumorm from the president of a big software company (who shall remain nameless). Atari is going to buy *Mindset*, a small computer company that has developed an incredible machine with graphics just as astounding as Amiga's. With *Commodore* owning Atari and Atari owning *Mindset*, the stage is set for the next generation computer war — Amiga versus *Mindset*. There should be more news on this shortly, and I'll let you know what's happening

SYNCOPTAIN

THE 64's DRUM MACHINE

A you might guess, this rhythm section hangs out in the SID chip. If you've spent much time making music on your Commodore 64, you've probably already met the bass player and envelope, you can get a pretty good bass sound.

You may not know, however, that if you use the "noise" waveform, you can imitate a drum set. This article will show you how to get a simple rock beat and combine it with a bass line and melody.

When you tell the drummer who is practicing next door to "keep the noise down", you are not far from the truth of the technical definition of "noise." Noise is a random mixture of all pitches, and is the main ingredient in the sound of drums. In fact, it has become common to add pure noise to cymbal sounds in the recording studio.

The noise output of your SID chip does not sound exactly like a drum, but it gets pretty close. Type in this program below and listen:

The key to making noise sound like percussion instruments lies in the settings of attack, decay, sustain, and release - also known

as the envelope, or ADSR. If you haven't worked out these terms before they must seem mysterious, but this program can help you understand them. Notice that in line 10 all registers, including the ADSR for voice 2, are set to 0. This clears out any old settings. Line 20 sets the attack and decay by **POKEing** SID+12,18. Because of the way your computer uses one memory location to set two different things, the actual values that are being set for attack and decay have to be derived with a simple formula. The attack is the number POKEd (that's the number 18 in the example) divided by 16, disregarding any remainder, and the decay is the remainder. The maximum for each is 15, the minimum is 0. This means that we are setting the attack at one and the decay at two - but what does that mean? It means that the sound volume rises to full very quickly, and then falls almost as quickly to the "sustain" level. In this case, the sustain level is 0, so the sound volume drops to nothing.

The resulting sound is like a "click".

Try changing the 18 in line 20 to 22. This leaves the attack at 1, but changes the decay to 5. Now listen to the sound.

Sustaining the attack

The sound volume produced by an orchestral instrument changes constantly in complex ways. Electronic instruments like synthesizers usually have to reduce the complexity to a level that mere machines can handle, so each note is split into a few parts that are controlled separately. The attack, decay, sustain, release (ADSR) used by the Commodore 64 is probably the most common configuration for such controls.

Line 70 changes the ADSR. **POKEing** SID+12,38, changes the attack to 3, which is a little slower, and the decay to 6, which is much slower. Sustain and release numbers are derived from the same formula we used for attack and decay, so **POKEing** SID+13,121, sets the

sustain level to 7, medium, and the release to 9, medium slow. This combination creates the "cymbal" sound. Try changing the values in line 70 to see how the sound changes.

You can set the speed by changing the TEMPO number in line 10. Notice that the timing loops are set up so that it is possible to fine-tune the rhythm. Basic is slow enough that it is necessary to adjust for the amount of time it takes to execute the POKEs. Actually, if you listen carefully, you'll hear quite a bit of variation in the beat - this drummer needs to practice. Most of these variations can be eliminated with a machine-code driver operating on the interrupt system, but that's beyond the scope of this article.

If you don't understand all of the filter settings (SID+22, 23 and 24), don't worry about it. They aren't crucial. They serve mainly to enhance the other settings. If this program doesn't sound right on your machine, try changing the filter settings, particularly SID+22, the cut-off frequency.

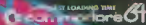
```
10 TEMPO=5:SID=54272,FORL=810TDB10+24:POKE1,0:NEXT:POKE10+23,242:POKE10+24,31
20 POKE10+8,6:POKE10+12,18:POKE10+22,140
30 POKE10+11,129:FORX=0T022+TEMPO:NEXT
40 POKE10+11,128:FORX=0T022+TEMPO:NEXT
50 POKE10+11,129:FORX=0T022+TEMPO:NEXT
60 POKE10+11,128:FORX=0T015+TEMPO:NEXT
70 POKE10+8,16:POKE10+12,38:POKE10+13,105:POKE10+22,200
80 POKE10+11,129:FORX=0T010+TEMPO:NEXT
90 POKE10+11,128:FORX=0T075+TEMPO:NEXT
100 POKE10+13,0:GOTO20
```

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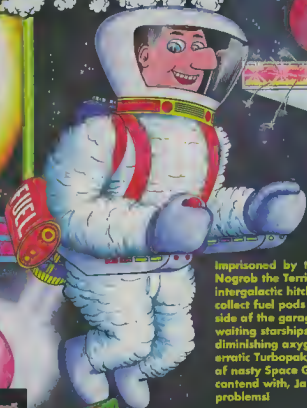
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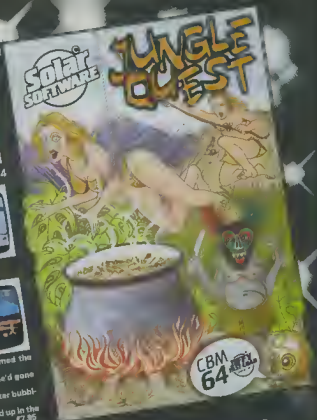
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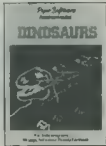
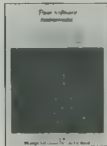
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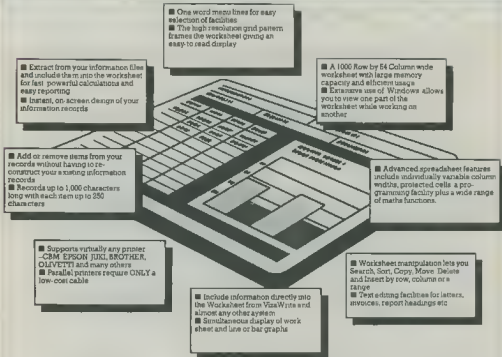
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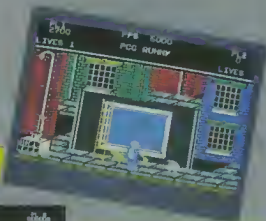
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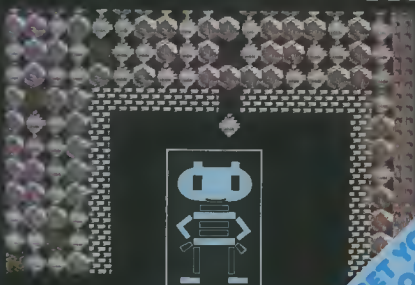
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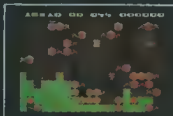
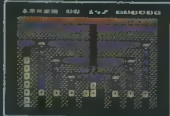
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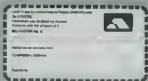
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Really Something Else

User friendly design — PART THREE

Improving data entry

by Chris Preston

Now we come to the central theme of our series on user friendly program design: the best way of arranging the actual data entry section of the program. We will base this article on an imaginary data entry section for a program that sets up and maintains a file of records, but the principles apply to any other data entry application.

The screen for the data entry 'Form' consists of a number of fields. Each of them has rules about what characters may be entered and how many of them. A cursor is displayed to show the user exactly where he or she is on the screen, the program allows you to enter and edit data, and to move from field to field — ideally, with the greatest of ease in both cases.

ACCOUNT NO
SURNAME
INITIALS
TITLE
ADDRESS
.....	
POST CODE
ANALYSIS CODE
CREDIT LIMIT

All the details entered from the screen are stored in a file that can be used by other programs in the suite. The analysis code, for example, may be used by a separate printing

program to allow the operator to print labels for everyone living in Hertfordshire who has expressed an interest in photocopyers.

The operations to be carried out on the file are:

- Enquiry
- Amendment
- Insertion
- Deletion

The first thing to do is to enter the account number of the person whose record we want to look at. Once the operator has done this, the program decides whether the record is already on file.

How it does this exactly is beyond the range of this article; maybe we'll cover that another time. But assume that the record is found: the details should be put on to the screen, and a message should be displayed in the status line something like this:

PRESS (A) TO AMEND; (D) TO DELETE; OR (SPACE) TO ENTER NEXT CODE

This gives the user the chance to examine the data before deciding what to do. Programs which ask whether the



Ken Paine 45

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operator wants to delete a record or amend it before the operator has seen the data are expecting you to take a shot in the dark; never a good idea.

If you press (D) for delete, the program should ask you to confirm this:

DELETE RECORD? PRESS Y OR N

Don't forget that the program should accept (y) as well as (Y).

If the user presses the (SPACE) bar to signal that he or she wants to look at another record, the cursor should be returned to the account number field (which should not be blanked). The operator may only want to change one character ('A1430' to 'A2430' for example), and we don't want to make the poor sod re-enter the whole field.

Browsing

At this point it's always a good idea to allow the user to move backwards and forwards through the file - say by using the (and) keys - to look at each record in turn. This 'browsing' facility is in fact essential where the key is not unique, as would be the case if we used the surname as a key instead of the account number - there are quite a few Smiths in the telephone directory!

Here we might be better off using the initials as a secondary key. That way, if the operator enters an initial, the program will search for 'J Smith' or whatever; but if no initial is entered the program searches for the first 'Smith' on the file.

The problem with using initials is that people often leave out their second initial. We might have records on the file for 'J Smith' and 'J A Smith' which in fact refers to the same person.

We are now getting quite deeply into the subject of 'system design', which is not really what the series is about. But this does show that even a simple data entry exercise like this one can be fraught with complications that appear only when the matter is studied in depth. There are many problems involved with using names as identifiers, and this is the reason why computer systems nearly always use codes of some sort instead.

On with the show. Pressing (A) shows that you want to amend the data held on file. The status line should be cleared (that should always happen once a prompt has been obeyed) and the cursor positioned over the first field in the body of the screen, which in this case is the SURNAME field.

But before going on to the actual data entry operation, we must just quickly look at what happens if the record requested was not already on the file. If the record does not already exist the user may want to add a new record. Or you may have mistyped the key. Either way the program has to ask for more information.

RECORD NOT FOUND. PRESS (I) TO INSERT OR (SPACE) TO RE-ENTER CODE

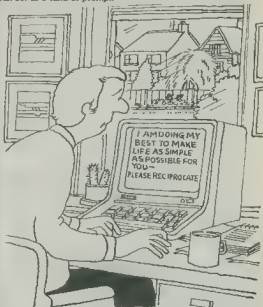
The (SPACE) bar returns the cursor to the surname field ready for a new key to be entered, once again without blanking the field.

If (I) is pressed then the cursor is moved down to the SURNAME field, ready for data to be entered. Here though, we can possibly ease the operator's task. A lot of data entry is repetitive; a field contains the same or similar information on many records in the file. To save the operator time and effort it is often best to leave the data from the previous operation on the screen; as we will see shortly, using a well-designed data entry scheme, editing is no problem.

If the insertion is the first operation in the day, have some built-in defaults which you can display. For example the company may have a 'standard' credit limit for its clients of £1000, so put 1000.00 in the CREDIT LIMIT field ready for the operator. That way, if the default value is correct he or she just has to press the (RETURN) key to accept the data. This is

just our philosophy of making things as easy as possible for the operator.

Of course, we cannot have any default for a name field. But leaving the previous record on the screen with its name field can act as a kind of prompt.



Control keys

Now at last we come onto the real data entry side of things. Our aim is to make life as simple as possible for the operator. To do this we have to implement a complete set of editing keys: data entry systems where the only control allowed is a "DELETE" key which deletes the previous character are not uncommon, but really they aren't worthy of the name.

Before coming on to control keys though, let's consider 'normal' data entry - where the user enters the correct data without having to do any editing.

First of all, he or she must be told how many characters can be entered in a field. This could be done by displaying a character such as a hyphen to show each available character position. As data is entered, these are overwritten; so when the cursor gets near the end of the field, you can see immediately how many spaces you have left. When the field is full, a beep should be given and the key ignored if you try to enter any more characters.

Some fields have restrictions on the characters which can be entered. Numeric fields obviously only allow the digits 0 to 9, the decimal point and the minus sign. Other fields may only allow Y and N, or some other combination of letters. In fields such as these pressing any illegal key should again produce an immediate beep and maybe an explanatory message.

In numeric fields we also have the restriction that we can only have one decimal point or minus sign; and that minus sign must come before any digits. Numeric fields are also somewhat strange in that the data in the field will be right-justified when the cursor comes into it, but the operator will want to start putting in data from the left-hand end of the field. There are two ways of handling this. The cursor can be placed over the leftmost position in the field, rather than at the first character of the field.

Programming

If the value in a numeric field is being changed at all however, it is probably being changed completely. So there's a case for saying that the cursor should appear in the first character position as normal, but if the operator tries to edit the field (by pressing any key other than Next Field, Previous Field or RETURN) the field should be completely cleared. This looks a bit drastic, and it does tend to startle an inexperienced user; but it's not as bad as it sounds - as once the operator has got used to using a computer, he or she will tend to re-enter short fields completely in any case, without bothering to use the editing keys.

Now for the control keys:

- **Cursor Left and Cursor Right:** these keys allow you to move the cursor around within the field. If you try to move outside the field, the computer should beep and ignore the key.

- **Previous Field and Next Field:** the normal cursor up and cursor down keys can be used to move the cursor between fields 'up' taking you to the previous field, 'down' moving to the next one. The RETURN key also takes you to the next field, and will of course be the key normally used for this purpose.

If the user quits the last field on the screen, we can assume that data entry is complete and ask if he or she is satisfied with the data. If 'PREV FLD' is pressed when the cursor is in the first field, the program should beep and the key should be ignored.

- **Insert and Delete:** the user should be allowed to insert characters only until the field is full. Systems which allow you to 'drop' characters off the right-hand end of a field by pressing the insert key are making it too easy to make mistakes.

Similarly, if you use the Commodore system where the DELETE key deletes the character before the cursor, rather than the character under the cursor (which is more natural), then obviously the operation should get beeped if he or she presses DELETE when the cursor is in the first position of the field.

Note that pressing INSERT should insert a space into the field, but pressing DELETE should cause a hyphen (or whatever) to appear at the end of the field so that you can still see how many more characters could fit in.

- **Clear Field:** the CLR key is ideal for this function, clearing of the whole field from the current cursor position to the end of the field is invaluable when the user is replacing a long entry with a short one, because it saves having to key lots of spaces to wipe out the end of the old data.

- **Home Cursor:** this key takes you back to the start of the field, and we can use the HOME key for this purpose.

- **RETURN:** carries out exactly the same function as the 'Next Field' key. And of course it is the one which is usually used because it's easier to press.

- **ESCAPE:** as many Commodore machines such as the Vic or 64 do not have a specialist ESCAPE key, we have to make do with the Commodore key or RUN/STOP. The purpose of the ESCAPE key is to leave data entry immediately, without changing any data: it's a panic button for when you suddenly find that you've been amending the wrong record (in spite of all the help we have given by displaying the data on the screen). Rather than forcing the user to correct all the fields that have been changed, we let the user press ESCAPE: that takes the cursor back to the ACCOUNT NUMBER field leaving the record originally selected intact.

Housekeeping

Whenever the cursor leaves a field, the field should be automatically tidied up. Alphanumeric fields should be left justified and any remaining hyphens changed to spaces. Numeric fields should be rounded to the correct number of decimal places and right-justified. If a field contains a money

value, for instance, it should always be shown with two decimal places; so if the operator enters '15' the program should change it to '15.00' when the field is quitted.

Often there are limits on the values which can be entered into numeric fields. These may be absolute (the value must lie between 0 and 499) or relative (field 4 must be greater than field 3).

Absolute range checks should always be carried out when a field is quitted, because we can say categorically that if the value lies outside the range it is wrong.

With relative checks, though, matters are not so simple. If the operator tries to quit field 4 when it is in fact less than field 3, the problem could be either that field 4 is too big or that field 3 is too small. The best way to solve the problem is to do the range check after the second field (or after the last one, if there are more than two); and to do the checking only if the operator tries to move down. If he or she tries to move up, the range check shouldn't be carried out: the user could be going back up the screen to change field 3.

It is definitely wrong, however, to leave the check until all the fields have been entered: carry out all validation as soon as possible! And if a range error is found, the computer should give a full description of the problem - not just a vague message like 'ILLEGAL VALUE'. Something like this perhaps

CREDIT LIMIT MUST LIE IN THE RANGE 100.00 TO 999.99

FINAL VOLUME MUST BE LESS THAN INITIAL VOLUME

When the program finds an error in a field and warns the operator with a beep, don't blank off the data in the field. The operator should be allowed to inspect the data to see where the mistake was made; and if there was only one character wrong; we don't want him or her to have to re-enter the whole field (in which case he would probably make another mistake).

When all the data has been entered, the program should ask the operator...

IS THE DATA CORRECT? PRESS (Y), (N) OR (ESCAPE)

(N) takes the cursor back to the first field on the screen; (Y) means that he or she is happy with the data, and the record can now be written back to disk or tape. (ESCAPE) means that the user has decided not to alter this record after all, and puts the cursor back on the ACCOUNTS NUMBER field.

Well, you were warned that there was more to data entry than a few INPUT statements! There is no denying that writing a subroutine to handle all that is a lot of work. And what's more, it really needs to be written in assembler rather than in Basic: otherwise even the slowest of one-fingered typists will be beating the program to the draw.

But don't forget that the subroutine only has to be written once, whereas the user probably has to use the program day after day for years on end.

To sum up then, we are trying to make the operator's job as easy as possible by:

- 1 Giving as many editing keys as possible. You can even add some more if you want such as "RESTORE THE CHARACTER JUST DELETED", or "MOVE TO END OF FIELD".
- 2 Carrying our range checks as soon as possible, but still giving the chance to correct mistakes easily. Don't let your relative checks force the user to change the second field of a pair if it is really the first one which is faulty.
- 3 Supplying the user with suggested values or defaults which can be accepted by pressing (RETURN).
- 4 Making the operation of the program as natural and as consistent as possible. Try not to make the (SPACE) bar do one thing in part of the program and something else in another part.



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This type of game was pioneered on Commodore computers by Melbourne House in

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their excellent game, *Zim Sala Birn*.

Most adventure games fans will be familiar with Melbourne's other adventure hits - *The Hobbit*, *Sherlock*, and *Castle of Terror*.

The graphics are so stunning they would not be out of place on a Christmas card.

To get your copy of *Merry Christmas* from Melbourne House call our helpline and send a 95 pence cheque or postal order to the value of 95 pence. Or, enclose this coupon (they will reward you a game of cards) along with a valid credit card and your game arrives.

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MERRY CHRISTMAS



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SIGNED

Adventure INTO THE VALLEY

with John Ransley

The great Christmas Rush is well and truly rolling. Software houses are falling over themselves to release their wares in time to cajole your festive spirit. Whether you're an Adventure purist or the occasional joystick grappler, the choice is so wide that you're sure to be tempted to take the can opener to your money box. Here's a look at some of the best software on offer...

A new title from Level 9 is always reckoned to be an Event, and Pete Austin groupies won't find anything to disappoint them in *Return to Eden* - which also marks Level 9's first graphic offering. I'm still not sure whether pictures actually improve my enjoyment of an adventure - but this title's visual appeal makes a convincing case for them. *Return to Eden* features nearly 250 locations (I'm told) and those I did manage to explore were interestingly and quickly drawn.

The storyline features unsexual hero Kim Kimberley who, fresh from scoring 110% in *Snowball*, finds him/herself trying to beat a phony murder rap in downtown roboville - and judging by what happened to me after my first wrong move, it sure is no place to take *Strawberry Shortcake*.

You'll encounter stacks of original, absorbing puzzles beginning for logical and/or inspired solutions, but the truly confounded (or just simple cheats like me) can write to Level 9 for a free saucy-saving cue sheet. Hook your laserdisc and buy a copy at \$9.90.

The same Level 9 team are behind *The Saga of Erik the Viking* - this time on the Mosaic label - which takes its title and inspiration from Terry Jones' children's story - but don't get the impression that it's pitched only towards the younger player. Some 300 graphic locations await your attention, and very clear playing instructions and helpful extracts from the book will soon get you on your way. Incidentally, the overall packaging and presentation of the art of Mosaic's other titles sets an excellent example; the



substantial library case even includes a spare parking space for the blank cassette you'll use to store any SAVED versions of the game.

The two other new titles from Mosaic are *The Stainless Steel Rat Saves the World*, based on Harry Harrison's classic time-juggling novel of the early 70s (you even get a free copy of the paperback as a source of some clues), and *The Nomad of Time*, developed from the Oswald Bastable stories of Michael Moorcock. They're both illustrated text adventures coded by Sharda (of *Petrigrew Chronicles* fame), which ensures an above-average quality of program. All three titles are fastidiously and cost \$9.95 each.

Raster Tip

Is your enjoyment of graphic adventures spoilt by the dreaded raster rogue, that distracting shimmering along the bottom edge of the hi-res picture where it meets the rest of the screen? It's sometimes possible to iron out this quirk in your own

Above: *Zim Sela Birn* - the first Commodore adventure combining joystick control with text entry.

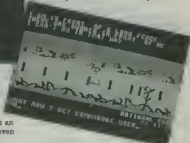
Right: *African Safari* - *Zim Sela Birn* in the jungle programs, but it remains as an all-too-evident feature of even many top titles.

Here's a very Heath Robinson but effective way of overcoming it. From a roll of blank vinyl, self-adhesive auralabon tape cut a strip about 1/4 wide and of a length equal to the width of your TV screen - and then simply stick it down over the 'shimmer line'. You can use unseed masking tape coloured black with a felt pen. Not exactly high tech but it will give your eyes a break.

Sluething with System 15000

Sometimes it's just impossible to pigeon-hole a program; as *System 15000* an adventure, a strategy game, or a simulation? Actually, it's none of these and all of them. And if you think that's confusing, you should hear about

its history. *System 15000* was first marketed under the Ferranti and Craig banner, but changes there meant that it never really got off the ground. But now, David Glee and Richard Craig have relaunched *System 15000* through Craig Communications (look for the "2nd Edition" flash on the packaging), and have made some improvements on the way



System 15000 lets you play the part of a computer-bound investigator who's out to track down an embezzled \$1,600,000; at the very least, you'll find yourself up against organised crime. Craig call it both a real time communication game and a simulation of computer hacking; that it's difficult to label is because *System 15000* is quite unique, but I've a feeling that it could start a trend.

My initial attempts have thrown up some crisp and unusual screen responses with excellent sound effects (a rarity in 64 adventures, despite its unsurpassed potential to produce them). So far, I've not sniffed out so much as a forged linchpin voucher, and I suspect that *System 15000* will keep me guessing and entertained long

Adventure

after my interest in some more conventional adventures has withered.

Not that you'd think so to look at its packaging, because System 15000 doesn't do itself any favours when it comes to counter appeal. A game that's so different and hard to describe needs to sound all the bells and whistles it can, the exciting dull and unsurprising presentation desperately needs rethinking if System 15000 is to get the attention it no doubt merits. Price is £12.95 on fastload cassette for the 64.

Turkish Delight?

You've got to bend it to Melbourne House for offering the broadest choice of adventures - ranging from the very playable **Classic Adventure** (fastload, £8.95) - their first text implementation of the one that started it all - to the visually entertaining but not so understanding **Zim Sala Bin** (fastload, £9.95). This animated romp through the land of 1001 OPEC members on a bid to defeat the murderous Sultan really is a lot of fun, and pulls off some nice tricks with 3D scrolling, although my copy exhibited a tendency for the text colouring to degrade when I entered a wrong response. Clear and complete instructions. Not exactly my goblet of god's milk but the youngsters will love it.

They're also sure to love **Cuthbert Enters The Tomb of Doom** from Microdeal. In fact, everyone will. This is what I call a proper arcade adventure; the fastload tape comes in a decent case complete with a colourful booklet full of hints and maps and an enigmatic key.

Cuthbert himself is a cane animated sprite, whom you must guide through the mysteries of more than 200 hi-res locations, avoiding assorted ghouls, berds, homicidal bats, and other minority groups of the kind you'd expect to encounter only in the lobby of the G.C. Simple? Try it - you'll need plenty of strategy and fast thinking. Definitely a superior piece of merchandise, my son - and at a touch under £7, what can I say. Traffic

Casting a Spell

Sorcery from Virgin (fastload, £7.95) comes a close second; a race against time, played out on 17 highly-detailed and colourful screens to save Stonehenge from the evil Necromancer and his

sulphurous cronies. Forget what you've heard about earlier Virgin software (I'm sure they'd like you to); this is good stuff. Initial Impressions of **Sooty**, a rollicking arcade adventure with scores of novel screens and as many treasures to find, are also very favourable. It's among the first 64 titles on the new Fuelbird label from British Telecom. Ever so cheap at £2.50 and not at all nasty. **Strangeways** follow up their first graphic strategy game for the C64, **Fame Quest**, with **Flame Island** and **Castle Fear** (£2.95, disk £12.95). More about these another time.

In the realm of full-blooded arcade action behind the thinnest of adventure veils, ask your micro emporium to run the demo mode of **Storm Warrior** from Frontrunner (£7.95, disk £9.95), which will give you some idea of the action this packs into five levels of play across 12 screens; it's different and the thunder and lightning are so realistic, they

and **The Wizard's Citadel** at £2.85 each from newcomers Triffid Software, an under-wrap title from Virgin based on The Eagle's famous Dan Dare strip.

Zim Sala Bin to win

Picking a dumber round the old catacombs recently revealed a mini library copy of **Zim Sala Bin** and **Classic Adventure** going spare; they're up for grabs! If you can solve that: What is it that God never sees, Kings and Queens rarely see, but we see every day? Write your answer on a postcard together with your name and address, and send it to: **Adventure Quiz, Commodore User 30-39, Farnborough Lane, London EC1R 3BH** to arrive by 14th December. First correct solution picked from the pile wins the brace.



Cuthbert Enters The Tomb of Doom - great fun but is it adventure?

ought to provide a free cover for the badge page

Rest of the Best

Other new titles expected to hit the streets by Christmas include **African Safari** from Interdisc (£9.95), another state of the art animated text adventure by the author of **Zim Sala Bin**; a conventional and top pedigree (Jamie Thomson et al) text adventure, **Tower of Despair**, from Games Workshop; a two-part graphic challenge, **Se Kai of Kariah**, from MasterVision (£7.50), as well as 64 versions of **The Wrath of Malgor**, **Black Crystal** and **Volcanic Dungeon** - the creations of the much-lamented Camell, now under MasterVision's wing; **Swords of Sorcery**, an ambitious animated quest from PSS at £9.95 which you can expand later by adding extra modules, **The Secret River**

introductory pages describing medieval society, myths, legend and religion alone are enough to trigger 101 ideas for your own adventures. And that's the strength of this book. It must be almost indispensable if you're a legitimate Dungeons and Dragons player, but if you have half a mind to start winning your own board or computer-based fantasy games, there's absolutely loads in it to help you. I can't believe that anyone will ever produce a better book of this kind, specially good value.

You won't need to cash up quite so many book tokens for your copy of David Estall's paperback **Adventures For Your Commodore 64** (Virgin, 128pp, £2.95), and it'll give you plenty of hours at the keyboard once you get the TV back. Here you'll find listings for six complete games, including **Schools Out** and **Hunt the Wumpus** for the younger player, to **Pearl Diver** (with sprites and sound) and **The Guardians of Arimathea** - a pretty meaty text adventure that's not half bad. The structure of the individual programs isn't described, but they're obviously open to your own study, and the author adds a useful half-dozen pages on adventure writing for the novice. Altogether an excellent buy for the beginner player/author - and for the more experienced gamer who wants something a little less demanding to go with the whole burgundy.

DON'T forget that there's a freshly-minted copy of **A J Bradbury's book Adventure Games for the Commodore 64** (very favourably reviewed last month) for the nearest tip-in/ind routine for enhancing adventure text screen display or presentation. Why not drop me a line with your idea now? We'll publish the best two. Meanwhile, here's wishing you all an Adventurous Christmas. ☺

Book look

Finally, if your spouse/companion/kid/rental company insist on reclaiming the TV this holiday, you can still avoid the season of goodwill by burying your mind in a good read. For the sheer joy of mopping up the product of a really imaginative mind, you couldn't do better than dig into Bruce Galloway's definitive guide **Fantasy Wargaming** (Patrick Stephens/Thames Publishing, 222pp, £7.95). The first pleasant surprise is that you're actually getting a hardback at that price. The second is that treasure trove of information it contains about creating scenarios and characters, playing rules, combat, magic and spells and almost every other element of the dungeoneer's art.

Bruce Galloway's thoroughness is exemplary, and the 60



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TALK TO ME LIKE 64s DO

Speech synthesisers for the Commodore 64

In the never ending quest to let you do more with your computer than just play games, speech synthesisers look like being an attractive (yet expensive) proposition. Just imagine it, your beloved Commodore 64 being able to talk to you. At least two speech synthesiser packages are now available for the 64. Kevin Bergin has conversed with **Speakezy** from **JCB** **Micros** and **Currah's** new **Speech 64** package, and asks himself whether all this talk isn't just a lot of hot air.

by Kevin Bergin

Getting your home computer to talk to you is not real news. A number of synthesisers have been around for quite a while like Adman's package for the Vic, JCB's for the Dragon and Currah's for the Spectrum. The latter two have now adapted those earlier versions for the Commodore 64. Bringing up the rear is Commodore with its very own Magic Voice speech module. Available (hopefully) by Christmas, it works on a different principle to the above, but is worth including for the sake of completeness. But let's get going with the newest offering, **Speech 64** from Currah Computers.

Speech 64

Speech 64 is a cartridge that not surprisingly plugs into the cartridge port of the 64. It has a DIN plug that goes into the 64's audio/video socket. This will cause problems for people using that port to drive a monitor. Although nothing is mentioned in the instructions, Currah will supply you with a video cable splitter (around £2) to let you connect both devices simultaneously. The audio socket lead is very short, making it difficult to have the sound go through an amplifier.

Anyway once the cartridge is correctly inserted and the 64 is switched on, the device is initialised with the simple command **INIT** (press return).

From here on the 64 will voice any key you press (providing the volume is turned up). This can be

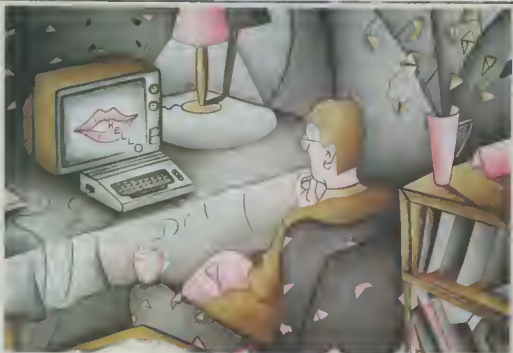
somewhat annoying if you are writing programs. No need to worry, the cartridge can be turned off with the **KOFF**, and on again with the **KON** commands. You also have the choice of two voices: low or high, each offered with or without inflection. This does give a wide range of different sounds.

Programs that talk

Presuming you wish to hear your 64 chattering away there is a wide range of choices when 'speaking' from a program. Currah have used the by now familiar **SAY** command. With this, the user may simply type in a word between quotes, for example; **SAY "WELCOME"** and the synthesiser will try to say 'welcome', but like many words it will need to spell it as it sounds; **SAY "WELKUM"**.

A few words of explanation here. **Speech 64's** software works by scanning the text you've inputted and then converting it automatically into the speech sounds required. The manual calls it the 'speech to text converter'. It does this by putting together a set of syllables (the component sounds that make up a word) from its stock. Although it uses a set of pronunciation rules, it can't cover every possibility - like some of the baffling spellings you find in the English language.

So you're provided with a fairly impressive look-up table for non-standard pronunciation. Therefore using the look-up table and



allophones, it is possible to create a likeness of most words and in any language (the review was conducted in poor English). Delays can be produced by using standard punctuation and the cartridge will give friendly error messages if you are using it from Basic.

All of the aforementioned methods can be combined. For example, speech may be produced using the **SAY** command with text, and allophones inside square brackets. Typing in text in upper case gives a higher intonation, whilst lower case gives a much deeper voice. That's pretty useful because you can approximate human speech patterns rather than being stuck with a droning monotonous voice. But you can't use it in Text to Speech mode.

Currah claims that Speech 64 does not slow down the 64 as the cartridge uses a buffer, which allows speech and other operations such as graphics to be produced at the same time. The problem is that any speech will take a lot longer to finish than most other operations (animation for example), this means that the overall effect is a lot slower.

Documentation

Almost non-existent is probably the best way to describe the manual. It comprises sixteen (very small) pages of information

on Speech 64. The first two pages deal with installing and maintaining the cartridge, a couple of examples are given in the form of direct mode statements to turn the cartridge on and off in both voices. The next two pages take you briefly through the **SAY** command with text and allophones. Another two pages are given over to allophones, with a couple of words on error messages. There is a page on different voices and one on the speech buffer.

So far, this is all very elementary stuff on using Speech 64 from Basic. The next four pages are on using the device with machine code. Is this any better? No, afraid not. Currah starts this section by implying you will have a long slog using machine code with Speech 64 — not very inspiring. However, the manual does go on to give you four small examples with brief explanations. The program to initialise the device from machine-code is given, and an example program that uses the 256 allophone speech buffer. There's also a brief explanation of how to get at the speech chip directly, without using the aforementioned **INIT** routine.

There is one page containing the decimal and hex codes for the allophones. This is useful because when you're using machine code you will need to convert the allophones you're working with into hex.

A speaking clock program is also listed on the penultimate page. The last page gives a list of the commands added to Basic when Speech 64 is initialised, which includes the first and only mention of the **BYE** command. This turns Speech 64 off until an **INIT** command is issued.

Using Speech 64

So what can you do with Speech 64? You can, of course, include it in your own programs and perhaps software houses will use it in games and educational products. Currah gave a list of five software houses that were producing games using the device. In fact only few checked out, the rest either said nothing or said they hadn't decided whether to use it or not. **Grenada** have included speech in *Stickee Express* and *Taskset* in its Cadoush Warner Bot, at present, there seem to be no other takers.

Fox 230.53 it seems that you get a fairly powerful if a little poorly documented speech synthesiser. How much one likes or dislikes it must be a matter of opinion. It seemed very slow and clumsy to use, as well as being a rather tiny re-production of the real thing — certainly not up to the best arcade standards.

The last comment must be that any speech synthesiser should have extensive software back-up if it is to be more than a novelty, and there seems to

be no substantial software in the making for Speech 64. As a footnote to this review Currah have just informed me that a number of software houses are showing interest in Speech 64 and a statement is to be issued by Currah in the near future.

Speakezy

Like Speech 64, Speakezy is a cartridge that plugs into the cartridge port on the 64. And it works in more or less the same way by using a standard set of allophones. It also has a DIN plug that fits into the 64's audio/video port. Once again JCR is offering a splitter lead to enable you to use a monitor. When the 64 is switched on Speakezy is initialised immediately.

Speakezy adds four commands to Basic, they are **SAY**, **SPEAK**, **ADD** and **WAIT ON**. The device and its commands are very easy to use. The **SAY** command is used with one of 72 pre-defined words, so you have a fixed library to work with. The library includes any number that the 64 can generate. Speakezy will also **SAY** numeric strings and variables. This means that the 64 could generate speech relating to locations using **PEEK** to return the value.

Unlike Speech 64, Speakezy needs to be told when to turn its voice off, each word needs a

continued on page 81

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continued from page 57

silence delimiter between 0-8 separated by a comma. Speakeasy also uses allophones with the command **SPEAK**. The format for this command is the same as **SAY** except the words must be spelled as they sound, each allophone must be spell correctly and separated with commas. The manual also points out that the **SAY** command is compatible with all Basic string-handling commands on the 64. So you can define phrases as string variables and add them together, even slice and concatenate them within a Basic program.

But there is also an **ADD** command which is used to join words together that are constructed with both the **SAY** and **SPEAK** commands. The last command is **WAIT ON**, although this is not a new command its use with Speakeasy is unique. The command **WAIT ON** can be used to halt the processor if Speakeasy is still talking, this allows the user to check that words are not overlaid.

Documentation

The Speakeasy manual is a good introduction and guide to Speakeasy's facilities. Each of the commands over its own section with the addition of at least one demo program. And all possible error messages are covered. Like Speech 64, there is a limited amount of technical information and advice if using machine code, but JCB does offer assistance to anyone wishing to write or telephone. Finally there's an alphabetic list of the pre-defined words and a list of allophones with some helpful noise followed by an allophone address table.

Conclusions

Much the same things must be said here as for Speech 64 but with more praise for the good documentation and ease of use. On the other hand there seems to be no software at all available for Speakeasy, so you will have to amaze yourselves with the device alone. At £29.95 (same as Speech 64) it is perhaps worth experimenting with, but how long will it be before commercial software uses in-built speech synthesis or before the user discards the speech unit because there's really not much scope for really productive use.

Not true, there may be many useful and practical applications, especially for the blind and impaired of speech. At present, though, speech synthesizers seem to be just for fun.

Magic Voice

Unfortunately, Commodore's Magic Voice cartridge couldn't be put through its paces here because, despite the length of time it's been talked about, the product is not yet available in Britain. So a few preliminary details must suffice.

Magic Voice works differently to both Speech 64 and Speakeasy in that it doesn't use allophones to build words, but a system of digitised speech - so you don't get an infinite vocabulary. In fact, the device is pre-programmed with a set of 235 'utterances'.

But it does sound much more realistic than the two aforementioned packages because the words are actually digital recordings of a human voice. You have a choice of male, female or child voices and

control over the pace of speech.

Despite the superior speech quality, its limited speaking range presents a few problems. A Commodore spokesman did tell us that the device will allow you to define your own library of words but couldn't describe exactly how that was done. Apart from that, there will be a range of disks (probably not cassette) that give you extra vocabulary.

Using Magic Voice

The cartridge should be in the shops in time for Christmas and

its major selling point will be as a complement to Commodore's educational software. The **J J Best** learning series, for example, uses Magic Voice as an optional enhancement. Other packages like Magic Garden and Magic Toolbox really need Magic Voice, and they won't be available until the cartridge itself appears. Two arcade games for the 64, Gorf and Wizard of Wor, also use it.

So it looks as though Magic Voice will be supported by software. But, at an estimated £49.95, its real value will take a lot of convincing.

Underreview		Speech 64
Description:	speech synthesiser cartridge for the Commodore 64	
Supplier:	Currah Computer Components Ltd	
Address:	Hollymount, Wooler Road, Hartlepool, Cleveland TS26 0AE	
Telephone:	0632-323535	
Summary:	meagre documentation and lack of software support make this technically classy product somewhat less than exciting or useful.	
Price:	£29.95	
Under review		Speakeasy
Description:	speech synthesiser cartridge for the Commodore 64	
Supplier:	J.C.B. (microsystems)	
Address:	29 Southborne Road, Bournemouth, Dorset BH6 5AE	
Telephone:	0202-423973	
Summary:	no software back-up but better documentation. Like Speech 64, no expensive toy.	
Price:	£29.95	



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AUTHOR - PAUL BUNN

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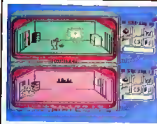
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SCREEN SCENE



Spy Vs Spy Commodore 64 Beyond Price £9 95

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★**

Spy Vs Spy—the popular Mad Magazine cartoon strip—is set to make its debut as a computer game in time for the Christmas rush.

The game is the work of First Star Software, the company headed by top American games writer—Fernando Hernandez.

Spy is produced under license in the UK by Beyond Software of Lords of Midnight fame.

The game features a unique split-screen display which enables two

players to play against each other simultaneously.

Alternatively you can choose to play against the computer.

There are two Spies—each searching for the hidden briefcase and only exit from the embassy. Before you make good your escape you also need to collect your passport, money and key to get out of the building.

This would be a piece of cake were you the only intruder in the foreign embassy. What makes Spy Vs Spy different



Scrabble Commodore 64 Leisure Genius Price £12.95

Presentation: **★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★**

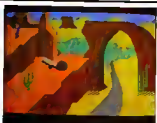
You would think that one of the advantages of a computerised game of Scrabble would be that it would enable you to get the game up and running pretty quickly, cutting out all that business of choosing a letter out of the bag, and using a membership for the missing Z.

Not so with the version just launched from Leisure Genius. This monster takes a good fifteen minutes to load. Take a slap on the wrists LG—most people would be half way through a conventional game using board and

tiles before this tape loads. Isn't it about time that all 64 software turbo loads?

That said—the software is excellent and provides something for that growing army of people who are sick of jumping from platform to platform gobbling fruits and shooting aliens.

Four different skill levels enable the player to choose a game that will suit them based on their average performance on the board game. A skill level one will suit players who average about the 300 points mark.



Cliff Hanger Commodore 64 New Generation Price £7 95

Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★★★**
Value for money: **★★★★**

Cliff Hanger is the first real attempt to turn a cartoon into a computer game maintaining the feel of animation.

The cartoon chosen is reminiscent of Road Runner and any second you are expecting your 64 to go Beep Beep.

The objective of the game is to kill the Bandido who is running up the valley taking pot shots at you.

The screens are generated randomly and offer you a variety of ways of getting even with Bando.

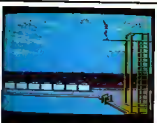
Most of these involve dropping some

sort of heavy weight on him from your vantage point on the ridge above the valley road.

Other screens offer you boomerang cannons, see-saw boulder mechanisms and even bombs to dislodge other boulders.

At first the game appears to be ridiculously simple until you realise after playing it for several hours that you haven't spotted the little Bando.

It takes quite a few goes to lob a boulder onto the Bando's head but when



Summer Games Commodore 64 Quicksilver Price £9 95 cass disk £19 99

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★★**

The idea is either shake the joystick or rapidly press the fire button to make your athlete move—the faster you shake or fire the faster your athlete moves.

The first game we tested was Daley Thompson's Decathlon from Ocean, which was the closest of the three games to the original Track and Field.

Two cartoon-style athletes compete in a series of track and field events—including Pole Vault, 100 metres dash hurdles, and decus.

One clever touch is that there are several advertising hoardings in the stadium with companies like W H Smiths Boots and Marjans. That must've sold a few eh boys?

Next up was Activision's offering—Decathlon an authentic ten-event challenge for up to four players.

This scored higher than Daley's game on graphics and it also benefited from a larger screen presentation of the track and athletes.

The Activision game also had better



Ghostbusters Commodore 64 Activision Price £10 99 cass £19 99 disk

Presentation: **★★★★**
Skill level: **★★★★**
Interest: **★★★★**
Value for money: **★★★★**

Who you gonna call? Ghostbusters. The pop song of the film hurls in your mind as the complex game of both loads into your 64.

Now we all know that a good film or a good pop song is no guarantee of a good game—many games players have learned this lesson the hard way.

My suspicious nature is quickly put at ease when I read that the ghost offering is the work of David Crane. In case you haven't heard Crane is the name that keyed Decathlon and Prefall 1 and 2 for Activision.

The game begins in generic 1980s fashion by giving you £10,000. But before you start planning a world cruise this is not holiday money but working capital.

You must use your cash to equip your ghost catching business. You'll need a vehicle and traps to catch the spooks.

The amount of money you speculate on equipment must be recouped when you set out on your rounds freeing the neighbourhood of its unwanted ghostly inhabitants.

In true American tradition the idea of the game is to make as much money as

is that there are two players racing against each other to achieve this objective.

By pressing the fire twice a pointer appears at a display of six gadgets to the left of the screen. From this list you can select a time bomb, bomb, gun, a sledge, fire bucket, spring, and map.

These booby traps are used to impede your opponents' progress and earn bonus points.

The map will show you your position in the embassy but loses your points

each time you use it.

If you happen to walk into the same room as the other spy you can either engage him in hand to hand combat or you can scarp.

The key to success in Spy is to keep an eye on what your opponent is doing at the same time as planning your own strategy.

The animation of the spies is ok. Spy Vs Spy is a sure fire hit and will come addition to any 64 owners' games collection.

Up to four players can play the game using the computer just to keep the score and act as a board or, up to three players can take on the computer.

In my opinion the game is at its best when used by one person playing against the computer. The computer is a much better opponent than a human being—not just because of its high skill levels it can play a very good game of Scrabble but also because it won't keep you waiting.

One drawback of the multiplayer op-

tion is that your opponents will have to seat themselves in rotation around the 64. Certain of the game-play options mean that your opponents will also have to look away from the screen whilst you think about your next move, consider the computer prompts, and look at your tray of tiles.

If you like Scrabble and you've got a 64 you won't want to be without this game. If it were not for this silly load time Scrabble would have ousted Zaxxon from the Screen Star spot.

you finally succeed it doesn't half feel good.

The game is moderately amusing and a brave attempt to try something different. Sameflow though—it doesn't quite work.

I found it repetitive and lacking any real challenge—not really a game for the experienced player.

One day cartoon animation will make computer graphics a thing of the past as far as games are concerned. But before that happens all micros will have to be

compatible with cheap, fast, laser disk units.

Attempting cartoon games without this technology is like trying to play Mozart on the spoons.

sound effects and a more fluid animation of the running movement of the athletes.

Although Activision performed well the gold medal has to be awarded to Quicklinks for the game licensed from Eyrer—Summer Games.

This really is something special. Summer Games is also the most original of the Games games—as it involves more than simply yanking the living daylight's out of your joystick.

The graphics really have to be seen to

be believed. Eight brilliantly animated events plus an opening ceremony with white doves flying up into the sky and eighteen national flags for you to choose your favourite country.

The winning medals for the best Games game in the Commodore User Challenge are awarded as follows: Gold Summer Games Silver Decathlon, and Bronze Daley Thompson's Decathlon.

possible by trapping the ghosts and reaching the top of the Zolt Turret with at least two of your fellow ghostbusters still alive.

The game still uses the buzz words from the film—ghosts are called "gim'es" and the villains "marshmallow men". But are people going to know what these strange words mean as the game is launched several weeks before the film? Yes says an Activision spokesman "The kids know what marshmallow men are". What's he calling a kid?

The catchiness of the pop song has

not escaped the manufacturers' attention and the player is induced to join in with the Ghostbusters chant at certain points in the game.

The acid test for games based on film and books is would they still be good games if you have never heard of what ever it is they are supposed to be about. In this case the answer is yes—recall of sound and graphics and a playable game. One gripe though—why should disk owners have to pay twice as much for the game as people buying it on cassette?

● SCREEN STAR ●



Zaxxon
Commodore 64
Joystick needed
U.S. Gold
Price £9.95

Presentation: ****
Skilllevel: ****
Interest: ****
Value for money: ****



When Sagar's Zaxxon hit the shelves two years ago hardened Space Invaders fans couldn't believe the quality of the graphics. True solidifying 3D graphics, accurate response to joystick, beautiful colours and a thumping good shoot 'em up to boot.

Now this reviewer can't believe the game has been so faithfully recreated on a home computer.

Had I not played the game with my own joystick I wouldn't have believed it—especially as I'd seen a couple of previous attempts on other machines fail miserably.

It's taken several months and a legal wrangle to get the game into the shops after Synapse UK—a manufacturer of business software and totally unconnected with the top American games house—slapped a writ on U.S. Gold stopping them from importing the game under the Synapse name.

A slight name change has enabled U.S. Gold to get the game out crediting it to a company called Synsoft—wonder what just reminds you of.

Let me say straight away that this legal tangle is a good news for 64 games as Zaxxon is set to be one of those games that no self-respecting Commodore owner would want to be without.

For the uninitiated the game is basically a space scene shoot 'em up. The object of the game is to destroy the evil Zaxxon—a giant robot that you can confront only when you have blasted your way through several preliminary levels.

The first of these is the flying asteroid city. You must destroy as many of the enemy ground installations as possible in this level. The

more enemy aircraft you destroy here the less you will encounter in deep space later in the game.

What makes the asteroid city the trickiest part of Zaxxon is the walls and electronic fences—over and through which you have to negotiate your shuttle's path.

On your first few flies the walls and fences are wide and far apart but on later ones you will need very skilful joystick control to get through them in a few gaps.

If you get through the asteroid city your next challenge is a shoot-out in deep space. This calls for a really quick finger on the fire button as you do battle with the aliens that you did not destroy on the ground.

Success in deep space also depends on correctly judging the distance and approach of the alien—no simple duck shoot this.

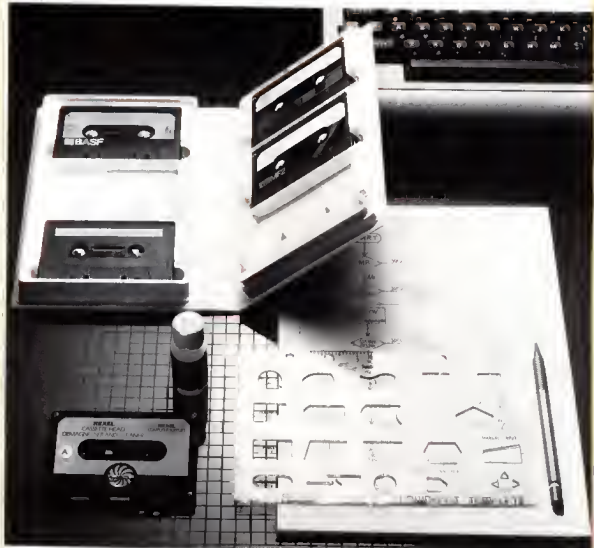
Now comes the final conflict as you seek to destroy the Zaxxon robot on the last remaining asteroid city. To do this you will have to score three direct hits on its main launcher.

The robot is a difficult moving target and is armed with deadly seeker missiles.

It will take you a good few hours play before you even get on to the right city to take on Zaxxon—and several more hours before you get the better of him.

If you manage this the game begins again only now it is faster and more difficult. The score you have now up is a guide previous game is what you take with you so it is possible to achieve some really ridiculous high scores—if, that is, you have the skill.

Quite simply the best shoot 'em up for the 64.



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SCREEN SCENE

Rapier Punch Vic-20 Software Projects Price £5.95

Presentation: ■■■■
Skill level: ■■■■
Interest: ■■■■
Value for money: ■■■■

Just when you thought all the Vic 20 games had died in Commodore have launched a super new 100 screen game for the unexpanded machine.

Yes, you heard me right, one hundred screens on an unexpanded Vic.

The object of the game is to find the treasure chest hidden in one of the darkened rooms.

But before you set out on your quest be warned—there are nasties in these rooms, waiting to pounce

on unsuspecting treasure seekers. As you explore more of the area turns white—as you leave it (it'll be hard) you.

The nasties are the usual assortment of dragons, dragons' eggs, spinning crosses and barmers. Barmers are small blocks through which you cannot move. It is very difficult to avoid these barmers as they are invisible.

I enjoyed Rapier Punch—it's a considerable programming achievement on the Vic 20.



Perils of Willy Vic-20 with 16K Software Projects Price £5.95

Presentation: ■■■■
Skill level: ■■■■
Interest: ■■■■
Value for money: ■■■■

Vic owners have had to look on in envy over the last few months as Jet Set Willy and Manic Miner have topped the charts with 64 and Spectrum owners reaching for their wallets in response.

Well now it's your turn to get some of the action as Software Projects have launched a Willy game for Vic owners with a 16K RAM pack.

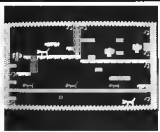
Minor Willy is faithfully depicted in Vic graphics right down to his most distinguishing feature—his

bowler hat.

In this Willy game our hero has discovered music and sets out to collect all the musical notes from the fourteen screens.

It lacks the original's zany—somehow Minor Willy isn't quite Minor Willy without Martin, main eating toilets, and mutant telephone.

That said—it's still a good game in its own right. It will take several days' play to get to the top of the fourteen screens.



Bomber Mission Vic-20 with 16K Commodore Price £4.95

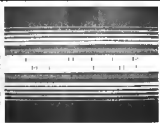
Presentation: ■■■■
Skill level: ■■■■
Interest: ■■■■
Value for money: ■■■■

Eleven gauges plus a radar screen give the promise of an involved simulation. All the controls are accessed through the function keys and the joystick. You are given the choice of three targets followed by a selection of payloads (various bombs and fuel pods) which should enable you to successfully complete your mission.

It's easy to take off and operate the flaps and undercarriage setting course is just a matter of leaning on the joystick. Providing you've flown high

enough at a reasonable cruising speed to conserve fuel and not sullied a tailwind hit from the interceptors the bombs can be released when the target distance reads zero.

The way the gauges and controls are explained within the program is fine but I had the uneasy feeling that there were a few bugs lurking around in the code. Despite two approaches and an eventual show of concern Commodore did not supply a replacement copy. Draw your own conclusions.



Wunda Walter Vic-20 with 16K Interceptor Price £6.99

Presentation: ■■■■
Skill level: ■■■■
Interest: ■■■■
Value for money: ■■■■

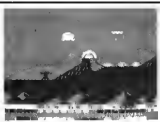
Wobbly, wacky and welcome is Wunda Walter. This is a funky, nonsense game requiring aeronautical skills and an aptitude for executing telling belly flops. Guide Walter in a flight across four distinctive, scrolling landscapes, swooping down to the ground to steam roller small, evidently offensive globes then leaping into the stratosphere again to avoid prickly vegetation and abrasive rocks. As you soar over hills and valleys, keep an eye out for marauding balloon builders bearing in mind that target

ing volcans aren't too healthy for wind bags either.

The title screen depicts the four regions which are to be your stamping ground: a red volcanic region, white icy wastes, a tropical sector; and an yellow desert.

Overall, a first rate fun game full of colour and even a scrolling commentary.

With the success of Arabian Knights under their belts it looks like being a very good year for Interceptor.



Trollie Wallie Commodore 64 Interceptor Price £7.99 cass £9.99 disk

Presentation: ■■■■
Skill level: ■■■■
Interest: ■■■■
Value for money: ■■■■

Supermarket shopping is not my ever-loving's idea of fun, to be fully sympathized with poor old Wallie and his daunting task of collecting 40 assorted items from an amazing supermarket. The supermarket abounds with all sorts of obstacles and problems, around which you have to guide Wallie, and once he has collected five items (which is the maximum his trollie will carry) he has to take them to the cash desk and pay for them before he can go on to collect the next five items.

If you find the way barred by a brick wall you have to go back and find the switch that will make it fall before Wallie can proceed with his task. You will need quick reactions and a lot of initiative.

Yet another first loader (duhrrrr!) is both mild and starts, good graphics and sound and instructions are written in verse.

Another good game for the Vic-20—and a very welcome launch too with the current shorts of Vic games.



SCREEN SCENE

Lazy Jones Commodore 64 Terminal Price £7.95

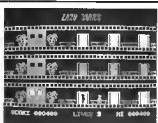
Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★**
Value for money: **★★★★**

Lazy Jones is a series of games in one game where you must become Lazy Jones, the laziest and most skilled shakas in the business, whose only ambition is to improve his games-playing and avoid work at all costs. In the hotel which has the unfortunate to 'employ' Lazy Jones there are 38 rooms, most of which have their own computer games which you, as Jones, take every opportunity to play instead of cleaning. Occasionally you hide in the broom cupboard or bathroom to avoid being

caught by your rate Manager, or the ghost of the previous manager, or to avoid running into your cleaning trolley and having a heart attack in the thought of work.

The games beyond the doors shown on the screen-shot feature some startling graphics. One of the shoot 'em ups has a series of spinning metallic rectangles that gyrate inwards your gunfueled

Feet leading, catchy tunes and good graphics made this the most enjoyable program I've seen this week.



High Noon Commodore 64 Ocean Price £7.90

Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★**
Value for money: **★★★★**

Later day Garry Coopers will be in their element, yet others will find that the cassette case gathers dust after the novelty wears off. This is not a run of the mill shoot out, the graphics are 3D, so you may move anywhere on Main Street slinging the lead about. As you mosey on out of the jail house the outlaws amble into town: shots are fired in any of the standard eight directions. The outlaws are set on robbing the bank and abducting women but with your sharp shooting, the undertaker will be

the one carting the goods. It is possible to hide in the bank or saloon.

I've only seen two Ocean programs and both were subject to lapses in the action under certain conditions. Probably this is just coincidence but I certainly should like to see more of these products.

One excellent feature of High Noon is the music - an upbeat 'High Noon' The game is the work of Andy Spencer of International Soccer fame.



Catastrophes Commodore 64 Mirrorsoft Price £6.95

Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★**
Value for money: **★★★★**

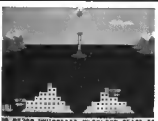
Dear Mirrorsoft, this game is intended for the underseights, right? If so... great, it not... oh dear! Those of very tender years should enjoy hosting building blocks from cargo ships and constructing hotels on a small offshore island, using a helicopter as a transporter. Two young Mr McAlpin may play, exercising their dexterity in skilful block placement and avoiding the occasional low flying jet.

To fulfil their contract, a predetermined schedule has to be adhered to.

But thwarting their efforts are hurricanes, electrical storms, earthquakes and floods, each of which destroys part of the buildings.

A peppy little tune, punctuated by sound effects, accompanies the job in hand, which apart from being good Play School fun is a dramatic introduction to the slings and arrows of outrageous misfortune. Thankfully a demo-mode is featured.

Another winner from Mirrorsoft.



Bristles Commodore 64 State Soft Price £8.95 cass £10.99 disk

Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★**
Value for money: **★★★★**

There are eight houses in need of sprucing-up, each more difficult to re-decorate than the last. Multiply by six skill levels and you end up with 48 different scenes.

Each room in a house is painted simply by walking through it. Lifts are a vital ingredient in this medley which also features various itinerant paint buckets; they are your loving hazards. A little sweetie-pie is ever ready to dab his mits all over your handy work but she can be kept amused and out of harm's way with

a supply of candy-canes.

Now we can't do without bonus objects so there's paint rollers full to collect. Watch out for the steam pipes from building five onwards. Got the picture? A classic scenario given a fresh coat of paint.

Much use is made of the Nutcracker Suite, coupled with the ability to select the painter's gender and we have a program well suited to the family. A good example of its kind and another excellent import from State Soft.



Sorcery Commodore 64 Virgin Price £7.95

Presentation: **★★★★**
Skill level: **★★★**
Interest: **★★**
Value for money: **★★★★**

An insistent rendition of the 'Sorcerer's Apprentice' sets the scene, then derails throughout the game maintain the feeling of a dark, mysterious age. You need to journey through 17 screens evading the touch of energy-draining forces of evil, collecting various objects and using them to expedite your progress. Casting spells, guzzling potions, swishing a few buckets, SEQUENCING actions correctly plus dexterity with the joystick may eventually see you through to Stonehenge. You traveled all that way through murky forests,

dark dungeons, flying over watery graves and similar locations with one object in mind - to defeat the Necromancer.

Apart from being harassed by ghosts and ghouls there are snap decisions to make en route - adventure style.

The whole presentation appealed, the 'stage sets' being unusual. It could be that by the time the early screens are easy meat, the game might pall, still that's entirely subjective.

Virgin's best game since the screen-scooping Falcon Petrol and Ill



Raid over Moscow Commodore 64 U.S. Gold Price £9.95

Presentation	★★★★
Skill level	★★★★
Interest	★★★★
Value for money	★★★★

Raid Over Moscow is the follow-up to Bruce Conner's excellent Beach Head. Unlike Beach Head, Raid Over Moscow places you in the cockpit of the world's fastest fighter bomber. You must lead your main on a bombing mission over the main industrial centres of the Soviet Union, in an attempt to knock out the computer installations which are guiding a salvo of nuclear warheads across the North Atlantic to targets in Canada and the U.S.A.

You must guide your ship out of the

landing bay and fly it through space towards the Soviet capital.

The plane must be flown very low to avoid being detected by the Russian radar network. Jet planes, patrolling tanks and stationary guns all take a pot shot at your plane.

Raid Over Moscow scores highly on graphics and playability. The game is much more difficult and challenging to play than Beach Head and will certainly take a lot to master.



Poster Paster Commodore 64 Taskset Price £6.90

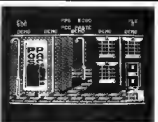
Presentation	★★★★
Skill level	★★★★
Interest	★★★★
Value for money	★★★★

To the best of my knowledge this is completely original – certainly very playable anyway. You have to slap up bill boardings with one sheet sufficient to complete screen one and twelve required for the final triumph after which there is a middle to solve.

Intently the correct roll of paper needs selecting, then the ladder has to be lugged into position and climbed. If your judgement was sound, as you press the fire button the roll will unfurl and stick, should you have the wrong roll or be

out of alignment it's a back to the drawing board. A few signposts of Taskset's imagination wait across the pavement attempting to frazzle you and honor of horrors, wait down your carefully mixed paste!

A few well armed flocks with the brush should settle them best to keep an eye on the Poster Condition Gauge though, 'cos if it turns to stodge you're defenceless. Let it be said that life up the ladder is not without complications – don't lean too far!



Ancipital Commodore 64 Llamasoft Price £7.50

Presentation	★★★
Skill level	★★★
Interest	★★★
Value for money	★★★

The launch of a Jeff Minter game is something of an occasion in the computer gaming world – not least because every Minter offering so far has been different.

Jeff's latest – Ancipital is no exception to this rule.

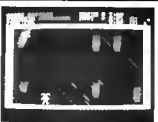
The game takes its name from the strange horned beast that you play in the game – guiding it through no less than a hundred screens.

In true Minter tradition the game has an element of super-fast zapping

Getting from screen to screen is only possible after shooting the interconnecting doors at the right moment.

Ancipital has lots of animals all over the place including some camels – the Minter trade mark. A guile appearance is also made by Neil from The Young Ones – whom as you might imagine is one of Jeff Minter's favourite actors.

I liked Ancipital it's a very playable, and keeps you amused with lots of wags, zaps and zany graphics. Could be Minter's best yet.



Ant Attack Commodore 64 Quicksilva Price £8.95

Presentation	★★★
Skill level	★★★
Interest	★★★
Value for money	★★★

When Ant Attack was launched on the Spectrum last year its "solidsoft" 3D graphics made hardened gamers re-viewers gasp.

But there has been a lot of good games released since last year and the quality of graphics is now incomparably higher than it was when Ant Attack was first launched.

And certainly as far as graphics on the 64 are concerned the game is not in a league of its own. Half a dozen games that I can think of are at least as good if

not better.

All you have to do is rescue the girl or boy trapped in the walled city of Antebates.

The game gets more difficult as on subsequent rescue attempts you have to first locate the captive.

Your only defence against the giant ants are 20 hand grenades.

There is also a timer which ticks away. Points are awarded for the number of ants destroyed and rescues carried out.



Pitfall II – Lost Caverns Commodore 64 Activision Price £10.99

Presentation	★★★★
Skill level	★★★★
Interest	★★★★
Value for money	★★★★

Pitfall II was such a success on the Atari VCS that gamers demanded and got a sequel. Now both games are available on the 64.

Pitfall II takes the basic treasure seeking idea of the game but adds a vertical dimension. And when I say vertical I mean vertical – some of the those caves seem to go down for ever.

The ultimate aim of the game is to find the lost Raj Diamond hidden somewhere in the caves.

Nasties to overcome include flying bats, poisonous frogs, scorpions, elec-

tric eels and – worst of all – the giant condors.

I personally rate Pitfall II higher than the first game. It's more difficult and will consequently take you longer to crack. The game also has a sensible marker system that sends you having to go right back to the beginning of the game each time you get zapped – you just go back to the last marker.

It's not necessary to have Pitfall I to enjoy the sequel and vice versa.



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The Vic Adventurer's Guide

a comprehensive games roundup

Most good computer adventures need lots of memory, which means that the Vic, with its miserly 3.5K memory, looks like being a non-starter; especially since software houses are devoting their attention to the eminently more suitable Commodore 64.

But the dedicated Vic adventurer still has a variety of games to choose from. Stephen Williamson introduces the different types of game you can expect to find in the shops. And he's compiled a comprehensive and up-to-date checklist of the adventure games available. Looks like there's more Vic adventure-fodder available than you thought? **by Stephen Williamson**

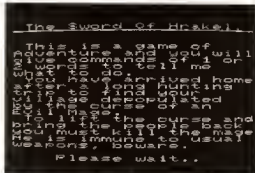
Adventuring with words

First let's consider text-based adventures, an art pioneered by the near-legendary Scott Adams. His series of adventures is available on cartridge from Commodore. These can all be relied upon to contain intriguing puzzles and well-written scenarios, but don't expect to find hundreds of locations. Notable Adams works are *Adventureland*, suitable for beginners as well as stretching the imagination of the more experienced adventurer; and *The Count*, perhaps the most difficult of the series to solve.

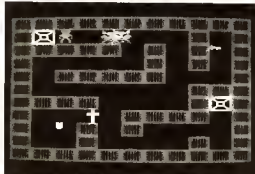
Kraal's Kingdom is a 32K text adventure from *Bustasaoft* which overcomes the Vic's memory limitations by loading in two 16K sectors. The code needed to play part two must be discovered in part one. The adventure incorporates some neat sound effects - doors breaking with a bang when you smash them open and you can hear the river water rushing below you as you try to cross the broken bridge. At £4.99 *Kraal's Kingdom* is very good value for money and takes lots of patience, ingenuity and imagination to complete.

For sci-fi fans *Bustasaft* has written science-fiction adventure, *Marooned*, in which you search an alien planet for a spare part needed to repair your damaged spacecraft.

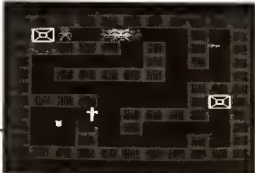
Romik has issued a low price four-game pack: three text adventures together with a set of puzzle and strategy programs called *Mind Twisters* - all for £10.99. The *Golden Apples of Zeus* is a gentle introduction to the world of adventure with comprehensive instructions, simple problems and few locations - definitely not for the experienced adventurer. But



Sword of Hrakel - will keep you up until the small hours.



Zol's Kingdom - arcade game dressed up as an adventure



Pharaoh's Tomb - another arcade game posing as an adventure.

Animal Magic and Sword of Hrakel are something completely different and are worth buying the set for. Both games fulfill the required criterion - that you end up playing them until the early hours of the morning, determined to get just that little bit further into the adventure. In *Animal Magic* as dawn breaks I reemerged on my night's quest. I'd dehydrated in the desert, nearly froze to death in the forest, got turned into a frog and overcome a herd of elephants by a very simple device that had taken ages for me to work out. And all this in search of a baby kidnapped by an eagle. Certainly makes a change from all those damned processes that I usually have to rescue in adventure games. As for *The Sword of Hrakel*, how do you catch the attention of a mediating guru and of what use is an agitated duck?

The three *Terminal Software* text adventures I've played *Magic Mirror*, *Rescue from Castle Dread* and *Curse of the Werewolves* all worth tackling. I particularly liked the *Curse* where attacking monsters do not always kill you outright but gradually weaken your constitution whilst you struggle to find ways of killing or getting past them. A weak constitution reduces the number of objects that you can carry. Some objects are placed randomly so that each time the game is played things are not always the same. Tricky stuff.

Martech's The Quest of Merravid finds you seeking the magical firestone hidden by a dragon. A fairly short adventure and not too difficult to solve but with some touches of humour. I tried making love to the serving maiden in the tavern but had trouble with her big brother when he saw me. I did a lot of

drinking in that tavern.

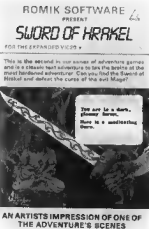
Finally, Exploring Adventures on the Vic is a three adventure cassette published in conjunction with a book of the same name by Peter Gerrard where full listings for the adventures can be found. A line by line commentary on Underground Adventure is an excellent introduction to the art of writing adventure programs, though the game itself requires a 32K RAM expansion to play which must surely limit its market.

Graphic Adventuring

Graphic adventures for the Vic vary from those like Dungeons which require a measure of strategy and foresight to play, to Samlock's Starship Escape which relies more on quick reactions and the 'shoot 'em up' skills of the arcade game. Several have a similar theme - a man wandering around various chambers battling guards and searching for treasure.

Outstanding amongst this type of game is Pharaoh's Curse from Heware, available on 'turbotapes' which, by some miracle of programming takes just over a minute to load the 16K program. It's a game for adventure and arcade fans alike. The action takes place in various sections of Pharaoh's Tomb and is fast and furious with mummies to fight, traps to avoid, treasure and keys to steal, doors to unlock, ropes to climb, lifts to ride and a winged avenger who carries you off to the darker recesses of the tomb. Graphics and sound are excellent and I am swiftly becoming a Pharaoh's Curse addict.

After trying Pharaoh's Curse I was eager to get to grips with The Wizard And the Princess,



Supplier	Title	Expansion	Type
Anurog	Dark Dungeons	16K	G
Anurog	The Dungeons	16K	G
Anurog	Dracula/Lost in the Dark	unexp	G
Anurog	Zek's Kingdom	16K	G
Anurog	Pharaoh's Tomb	16K	G
Argus	Cells and Serpents	16K	G/T
Argus	Demon Knight	16K	G/T
Argus	The Valley	16K	G/T
Androgeneic	White Barrows	16K	G
Burnasoft	Tomb of Drewan	16K	G
Burnasoft	Death House	16K	T
Burnasoft	Kraal's Kingdom	16K	T
Burnasoft	Marooned	16K	T
Burnasoft	Vortex	16K	T
Burnasoft	72 Hours	16K	T
Scott Adams Series -			
CBM	Adventureland	unexp	T
CBM	The Count	unexp	T
CBM	Mission Impossible	unexp	T
CBM	Purple Cove	unexp	T
CBM	Voodoo Castle	unexp	T
Duckworth	Exploring Adventures on the Vic	16K/32K	T
Haresoft	Harraiser	16K	G/T
Heware	Pharaoh's Curse	16K	G
Liversoft	Sphinx	16K	G
Martech	Quest of Merravid	16K	G
Metbourne	Wizard and Princess	unexp	G
Maplin/Epyx	Sword of Fargol	16K	G
Maplin/Epyx	Rescue at Engel	16K	G
Mr Micro	Gold Rush	unexp	G
Mr Micro	Mysterious Island	16K	G
Mikro-Gen	Mines of Saturn/Return to Earth	5K	T
Phoenix	Four Gates to Freedom (arcade game plus text adventure in one package)	16K	G/T
Quicksilver	Trader	16K	G
Rabbit	Colnet's House	8K	T
Romik	Animal Magic	16K	T
Romik	Sword of Hrakel	3K or 8K	T
Romik	Golden Apples of Zeus	16K	T
Samlock	Starship Escape	16K	G
Terminal	The Curse of the Werewolf	16K	T
Terminal	Magic Mirror	8K	T
Terminal	Rescue From castle Dread	16K	T

from **Melbourne House**. It's a five part graphical adventure for the unexpanded Vic that has featured in the Vic best-seller lists for some time - someone out there must like it! Sadly, I came away disappointed after only a few minutes.

The games are written in Basic with unimpressive graphics and have the flickery animation that mars many a Basic game. After playing each game, or 'chapter' as the instructions call them you have to wait until the next section loads. You must find a castle, battle a dragon, get lost inside a 3D maze, rescue a princess and take her across a bridge guarded by a Troll - all in a day's work, no doubt.

Zok's Kingdom and Pharaoh's Tomb from **Airlog** are two more examples of the graphical character wandering around various chambers. But whilst there are some monsters to avoid, the emphasis in both games is on problem solving; finding just the right equipment needed to enter locked chambers, cross moats or lighten darkened rooms. Zok's Kingdom should baffle you for a while, though Pharaoh's Tomb suffers from a man who wanders painfully slowly across the screen in response to pressing direction keys.

The same criticism applies to the hero in **Audioquest's** The Tombs of Drowan who meanders through the silent, (no sound in this one) 400 chamber tomb. Each guard encountered has a different strength value, so weapons must be chosen carefully. A powerful petrify spell is wasted on a weak guard. No puzzles to solve here; you just search for the four magical runestones and an amulet. There is a save game facility to allow you to go to bed and live to fight another day. Not a classic, but worth a few games.

Trading with aliens

The Trader from **QuickSilva** is a science fiction adventure in three 16K parts in which you play the role of a trader wheeling and dealing with various aliens on planets within the Mendeth System. The object of the game is both to survive and to make a fat profit after your journey to the alien worlds. Some simple arcade games are included to liven things up a bit. And random elements provide some variety each time the game is played.

There are some nice pictures to look at. Fine examples of what

can be achieved with a bit of ingenuity using those built-in Vic low-res graphics characters. I enjoyed my first trading journey, though I did fall down a pit to my doom near the end of the adventure, and I drove some hard bargains. However, after a few plays, the novelty of the game began to wear off. There did not seem enough stimulation in Trader for the game to have lasting appeal.

One of the first non-computer role-playing games was **Dungeons and Dragons**, a complex game using lots of dice, players jotting things down with pencil and paper, in which a fantasy world was created in the imagination populated with heroes, monsters, magic, and the like which often took place within the confines of a dungeon system. The **Dungeons** and **Dark Dungeons** from **Airlog** are two games written by the same author that seem to recreate some of the appeal of **Dungeons and Dragons**.

A character is generated by the computer who possesses attributes like strength, intellect and dexterity. You choose to be a fighter or a magician and after purchasing weapons and equipment, you are plunged into a 3D maze dungeon inhabited by monsters who guard treasures, weapons and items needed to your quest. Single letter commands are used to make decisions about movement, combat, taking objects, drinking potions and consuming food (which must be taken at regular intervals to prevent starvation). Survival is difficult and requires judgement and strategy as well as a fair amount of luck.

Dark Dungeons uses a similar system to **Dungeons** but has a different set of monsters and torches which burn out very quickly leaving you to wander around in darkness. It may lack the problem solving of some adventure games, or the fast action of **Pharaoh's Tomb**, but it's very challenging and will grow on you.

So it looks as though there's a reasonably wide range of adventure games available on the Vic, for all tastes and levels of expertise. But according to almost all of the software houses, you can expect little in the way of new adventures in the near future. Only one software house, **Sophisticated Games**, had anything new to report - a 350 location, ten-part adventure called **Love's Labour's**, coming soon.

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by Ian Stewart




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Virtuals HOW TO TYPE IN VIRTUALS

How we reproduce listings.

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the typographic control codes with more meaningful symbols.

When you see It means... And you...

[CU]	cursor up	press the cursor up key (shifted)
[CD]	cursor down	press the cursor down key
[CL]	cursor left	press the cursor left key (shifted)
[CR]	cursor right	press the cursor right key
[HOME]	cursor to the top left-hand corner	press the HOME key
[CLS]	clear	press the CLR key (shifted)
[DSF]	change to insert	press the DSF key (shifted)
[BLK]	change to black	press the BLK key (CTRL and 1)
[WRT]	change to white	press the WRT key (CTRL and 2)
[RED]	change to red	press the RED key (CTRL and 3)
[CYN]	change to cyan	press the CYN key (CTRL and 4)
[PRN]	change to purple	press the PRN key (CTRL and 5)
[GRN]	change to green	press the GRN key (CTRL and 6)
[BLU]	change to blue	press the BLU key (CTRL and 7)
[TEL]	change to yellow	press the TEL key (CTRL and 8)
[RFT]	reverse on	press the RFT key (CTRL and 9)
[OFF]	reverse off	press the RFT key (CTRL and 0)
[SPC]	space	press the space bar repeat the specified number of times

When you see any of the codes prefixed by a number, you must press the appropriate key the same number of times

for example
[3SPC]
means - press the spacebar three times

or
[SCD]
means - press 'cursor down' key five times

[G<key] press specified key together with CTRL key
[G>key] press specified key together with CMD key

These listings we generally run out on a letter-quality printer though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes

CLP	...	⌘	(REVERSED HEART)
HUP	...	⌘	(REVERSED S)
RVS ON	...	⌘	(REVERSED E)
RVS OFF	...	⌘	(REVERSED UNDERSCORE)
CURSOR UP	...	⌘	(REVERSED SHIFTED #)
CURSOR DOWN	...	⌘	(REVERSED O)
CURSOR LEFT	...	⌘	(REVERSED UP BRACKET)
CURSOR RIGHT	...	⌘	(REVERSED LEFT SQUARE BRACKET)
SET COLOUR TO			
BLACK	...	⌘	(REVERSED SHIFTED P)
WHITE	...	⌘	(REVERSED E)
RED	...	⌘	(REVERSED UNDERSCORE)
CYAN	...	⌘	(REVERSED SHIFTED #)
PURPLE	...	⌘	(REVERSED O)
GREEN	...	⌘	(REVERSED UP BRACKET)
BLUE	...	⌘	(REVERSED LEFT SQUARE BRACKET)
YELLOW	...	⌘	(REVERSED P)

THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO. AS WITH THE OTHER NON-ALPHANUMERIC KEYS, THEY APPEAR AS "SPECIAL".

CHARACTERS IN A LISTING

F1	...	F2	...
F3	...	F4	...
F5	...	F6	...
F7	...	F8	...

FOR THE UNEXPANDED VIC-20

[illegible]

galloping horses and line 750 checks to see if a horse has reached the winning line.

Lines 800- 900

Print out the winning horse's Number and Name, who backed it and the starting price (Set by Y) and adjusts the capital of each punter.

Lines 2500-2550

Sorts out the Winnings Table in order of capital remaining after 6 races.

Lines 2555-2560

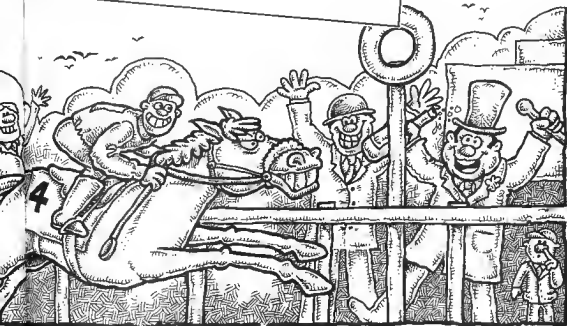
Prints out the Warnings Table

Lines 2570-2590

"Another Go?" Routine.

Lines 2600-2630

Asks if same Punters are playing. If so, resets variables and returns to initial screen. If not, Auto-runs.



KEY REPEAT – FOR THE COMMODORE 64

This short routine lets you print any character repeatedly on the screen just by continuing to hold the key down. The routine is not affected by Basic because it's written in machine-code and is set up in the cassette buffer.

by William Fong

Once you've typed the program in, you enable it (and disable it) by pressing F1. Then, if you hold a key down for more than half a second, the character is printed over and over again until the key is released. Pressing Run/Stop/Restore

totally disables the routine, but it can be recalled with SYS 832. Remember, once you've typed in the listing, make sure you SAVE before you RUN or you will lose everything.

```
0 REM REPEAT - © WILLIAM FONG 1984
1 PRINT "ICLS3"UNTIL:POKE$3280,0:POKE$3281,0:FORN=832TO886:READD:POKEIN,DINEXT:SYS
832,NEN
2 DATA120,173,20,3,141,46,3,173,21,3,141,47,3,169,89,141,20,3,169,3,141,21,3,88
4 DATA86,168,19,201,4,240,7,201,8,240,11,108,46,3,169,128,161,138,2,108,46,3,1
49
5 DATA0,141,139,2,108,96,3,32
6 DATA120,173,20,3,141,46,3,173,21,3,141,47,3,169,89,141,20,3,169,3,141,21,3,88
```

PRINT AT – FOR THE COMMODORE 64

This simple routine lets you place text anywhere on the screen, without using all those tedious cursor commands. Remember, SAVE the loader before you RUN it, otherwise the NEW command in line 30 will destroy all your efforts.

by Fred Reid

When run, the FOR-NEXT loop in line 30 POKEs the code into the protected memory area above 49182. The routine can be used in program or direct mode, and is called by SYS49264,Y,X,"text" where y is the vertical component between 0 and 24, and x is the horizontal component between 0 and 38. Be careful when printing to screen line 24, as this causes the screen to scroll.

```
1 REM** 'PRINT AT' SUBROUTINE
2 :
3 REM**USE AS SYS49264,Y,X,"TEXT"
4 :
5 REM**WHERE Y=0TO24 & X=0TO39
6 :
7 REM** BY FRED REID
10 :
20 FORI=0TO057
30 READA:POKEI+49264,A:NEXT:NEW
40 DATA32,241,183,134,87,32,241
50 DATA183,134,88,224,40,176,6
60 DATA169,87,201,26,144,3,76
70 DATA72,178,32,102,229,165,87
80 DATA240,9,169,17,32,22,231
90 DATA198,87,208,247,165,88,240
100 DATA9,169,29,32,22,231,198
110 DATA88,209,247,32,253,174,76
120 DATA160,170
```

```
1 REM** 'PRINT AT' - EXAMPLE
2 :
3 :
10 PRINT"ICLS3"
20 FORP=24TOISTEP-1
30 SYS49264,P,P,"WHAT ?"
40 NEXTP
```

AUTO-LINE

Here's a useful little listing that will help you save time when writing your own programs or copying listings from magazines into time.

The Auto-Line numbers line numbers by simply pressing return. This means that you don't have to keep stopping to check what line number you should be entering and helps you avoid mistakes.

You'll find it particularly useful on longer programs.

by William Fong

```
0 REM AUTO-LINE 1 © WILLIAM FONG
1 PRINT"ICLS3"UNTIL:POKE$3280,0:POKE$3281,0:FORN=49182TO49256:READV:POKEIN,V:NEXT
N:SYS49182
3 DATA169,86,133,2,133,4,133,5,133,6,169,49,133,3,120,169,27,161,20,3,169,192,14
1
4 DATA21,3,88,96,165,211,201,1,208,6,169,60,197,197,240,3,76,89,234,169,0,133
4 DATA211,169,40,162,4,213,2,208,5,202,224,255,208,247,232,134,198,160,0,136,181
7 DATA2,153,119,2,300,202,224,255,208,245,230,198,169,32,153,119
8 DATA2,162,1,246,2,169,58,213,2,208,9,169,48,149,2,232,228,5,208,239,76,49,236
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[Overseas orders add £1.50 P&P].

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AUTOCALC 64

COMMODORE 64

THE SPREADSHEET IN A CLASS OF ITS OWN

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Q: Which spreadsheet is suitable for accountants, engineers, scientists and home users?

A: Autocalc 64 is ideal for any application involving extensive manipulation of data and formulae for financial planning to market research.

Q: Which spreadsheet offers an advanced level of formula handling?

A: Autocalc 64 copes easily with trigonometrical functions, parenthesis and boolean logic as well as totalling and averaging.

Q: Which spreadsheet accepts complex conditional statements?

A: Autocalc 64 can handle statements as complex as IF $a1 < 4,000$ OR $a1 > 8,000$ AND $a2 = 500$ THEN $b1 = 0$.

Q: Which spreadsheet offers a flexible screen format?

A: Autocalc 64 allows you to select (i) column widths from 3 to 30 characters (ii) the number of rows/columns you need (iii) up to 2,000 cells of information (iv) text or numerical entries lined up to the right or the left, or a combination.

Q: Which spreadsheet offers a choice of numerical formats?

A: Autocalc 64 gives you a choice of (i) integers (ii) floating decimal point (iii) currency (iv) any combination of these.

Q: Which spreadsheet offers a full 'replicate' facility?

A: Autocalc 64 has an advanced replication function for transferring text, data, formulae or conditional statements from any cell (or block of cells) to any other(s) without monotonous retyping. A 'go to' facility will take the cursor instantly to any cell of your choice — saving time.

Q: Which spreadsheet is easy to use yet advanced in operation?

A: Autocalc 64 is designed to guide you — helpful error reports diagnose input or formulae errors. A full demonstration program and comprehensive instructions are included.

Q: Which spreadsheet is compatible with standard Commodore printers?

A: Autocalc 64 gives you a printout facility using any of these printers: Commodore 1515, 1525, MPS 801, 1526, MCS 801, DPS 1101, Seikosha GP100VC.

Q: Which spreadsheet is 100% machine code for fast efficient responses, and offers a choice of saving to disk (using 1541 drive) or to tape using a C2N unit?

A: Autocalc 64 — as if you didn't know!

Q: Which spreadsheet sells at a realistic budget price?

A: Autocalc 64 costs just £14.95 on tape, £19.95 on disk inclusive of VAT and P&P.

Q: Where do I get one?

A: Ring us now on 06286 63531 (24 hours) to place your ACCESS or VISA card order, or complete the order form and send it to us today. (Prompt delivery promised). Autocalc 64 is available only direct from Richard Shepherd Software.

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*No graphics on these versions.

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As part of our continuing development of innovative software, we are always looking for software titles you can do with a view to publishing.

Virtual {



A little practical program for the Commodore 64 to try on your 1520. It's ideal for plotting your own Biorythms, which for those of you who have never heard of them, are the basic 'life-cycles' which vary our physical, emotional and intellectual abilities from day to day.

by Chris Parker

The three cycles change at a different rate to each other. The Physical cycle has a 23 day period, the Emotional cycle has a 28 day period and the Intellectual a 33 day period. From the day you're born these cycles are constantly changing their relationship, but there are certain factors that are constant. Above the central line they are said to be **positive**, below the line they are **negative**. When they cross the central line, they are said to be **critical**. That means that on a critical day you're more prone to making errors or poor judgements - of course that doesn't mean to say you will have a bad day.

Some Japanese companies take particular note of their delivery drivers' biorhythms, and they claim accidents have been reduced by warning the drivers when they are liable to be less alert than normal. But, whether you believe in them or not, they are a bit of fun and the attached



```

1 REM DIMENSION F(200,100)
2 REM 1201 PLOTTER 6 CM 40
3 REM BY CHRIS DIAMAN
4 REM *****
5 DIM MAX(12),OV(12)
6 FOR LP=1 TO 12: READ MAX(LP): NEXT
7 FOR LP=1 TO 12: READ OV(LP): NEXT
8 PRINT CLR CUD CUD "HIT BENTHYS PROGRAM"
9 CUD CUD ENSURE 1201 PLOTTER SET UP WITH PEMS 1M
10 PRINT AND SWITCHES ON - RETURN WHEN READY
11 GETA% IF A% THEN GO TO 12
12 OPEN "C:\ASC1" PRINTING
13 OPEN C:\1 REM C:\1 OPEN
14 OPEN C:\2 REM C:\2 OPEN
15 OPEN C:\3 REM C:\3 OPEN
16 OPEN C:\4 REM C:\4 OPEN
17 OPEN C:\5 REM C:\5 OPEN
18 PRINT "HIT - GOOD PRINTING"
19 PRINT "CUD CUD: CUD INPUT DATA OF BIRTH IN FORM 00,MM,YY"

```



program can be used on anyone born after 1900. All you have to specify is the date of birth and the month for which you want the biorythms plotted. All dates should be put in with the day, month and year separated by commas (eg 21.10.56).



```

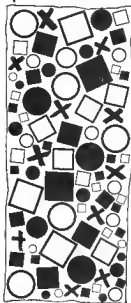
500 PRINT#4, "INTELEXTU.1"
550 PRINT#1, "M0.0-2000PRINT#1: REM RESET ORIGIN
560 PRINT CD=CD-AND(OTHER CHAR#) 1/2/1 IF
570 DET ARR# IF DET#1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100/101/102/103/104/105/106/107/108/109/110/111/112/113/114/115/116/117/118/119/120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000/1001/1002/1003/1004/1005/1006/1007/1008/1009/1010/1011/1012/1013/1014/1015/1016/1017/1018/1019/1020/1021/1022/1023/1024/1025/1
```

```

141 INPUT OD,MM,YY: VB=
150 GOSUB 1000
160 IF IERR THEN 150
170 OD=OD+1:MM=MM+1:YY=YY+1
180 INPUT "CLD=" CLD:MONTH=VB+MM+1000
190 ERL=VB+YY+1000:GOSUB 1000
200 IF ERL THEN PRINT "CLR<CLD CLD> NOT GOOD"
210 GOSUB 2000
220 DO=DO+1:MM=MM+1:YY=YY+1:INT(YV/4)=INT(YV/4)+1:VB=VB+1:VB=VB+2031-IDB+OY(SNR)+1
230 IF PY=0 THEN PRINT#2:231+231
240 ERL=VB+1:INT(EV/2)=INT(EV/2)+1
250 IF ERL=0 THEN PRINT#2:251+251
260 IF ERL=0 THEN ERL=28
270 INZ=VB+1:INT(YV/2)=INT(YV/2)+1
280 IF INZ=0 THEN INZ=31
290 FOR OV=23 TO 52 STEP 5:PRINT#1"N",OV:OV=OV
300 IF OV=23 THEN PRINT#2:31 CD=PY+1:GOTO 230
310 IF OV=29 THEN PRINT#2:31 CD=EV+1:GOTO 230
320 IF OV=33 THEN PRINT#2:31 CD=ERL+1:GOTO 230
330 IF CD=0 THEN PRINT#2:31 CD=INZ+1
340 GOTO 1500
420 NEXT OV
430 PRINT#1"N",34+240
440 PRINT#2:31 PERIOD PER
450 PRINT#4,"PHYSICAL "
460 PRINT#2:21 PER GREEN
470 PRINT#4,"EXTENSIONAL "
480 PRINT#2:31 REC BLUE

```

[illegible]



A nice'n simple Virtual offering that incorporates two essential elements of game-play: increasing difficulty and a race against time.

Using the cursor keys to go up, down, left and right, your bouncing spot must collect the crosses and then go to the Home square. Each time you clear the screen, the number of

```

2 REM CROSS COLLECTOR BY MICHAEL HEATING
4 K=1 B=55:M=120
5 TL=999:R=0
6 IF S41 THEN S=0
10 PRNTH:1CL5:1A=542*21P=52290:POKEP,00,POKEP,1,11:K=20:1P=2
20 FOR R=194401953:POKEP,160:POKE 542*21R,14:HEX1
30 FOR M=108:M=INT(RMD:11810001:944-POKEA,111:POKEP,160:HEXTR
40 GOSUB5000
42 GOTO1103STEP 4
50 GOTO POKE1202,102,POKEA1202,"
52 IF M THEN M=0
54 P=1024:K=4081:POKEP,81:POKEP,1,5
56 IF T=0 THEN WAIT 159,1
58 IF T=0:ICU1:ANDY -1:THEMD=1
60 IF T=0:ICU1:ANDY -2:THEMD=2
70 IF T=0:ICU1:ANDY -3:THEMD=3
72 IF T=0:ICU1:ANDY -4:THEMD=4
74 PRINT:1REV11MDH:123CDIKEYS COL:1KK1 KEYS:1K1 TIME:1T
76 IFD=1ANDPEE1PX=401:1600RY=23:THEMD=1
78 IFD=2ANDPEE1PX=401:1600RY=23:THEMD=1
80 IFD=3ANDPEE1PX=401:1600RY=23:THEMD=1
82 IFD=4ANDPEE1PX=401:1600RY=23:THEMD=1

```

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Space Trap



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MON 64 handic software



MON 64 Developed by Handic Software for the screen programmer on the Commodore 64 MON 64 is a machine code monitor with two modules, a mini assembler, disassembler, full printer and DIBS support and three running modes for debugging. An outstanding feature is the reset button. If used when the computer locks up whilst debugging in Basic or Via line Code the reset button will return you to your program without losing a line no matter how bad the bug. MON 64 is an indispensable tool for the experienced programmer and is available from your local software dealer or clip the coupon.

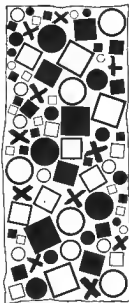


FOR THE COMMODORE 64

crosses increases. Too easy for you? Not really, because there are hidden obstacles to block your path – those increase too.

Two nice features: pressing the space bar brings you immediately to the next level, and pressing the 'S' key stops the game.

by Michael Keating

[illegible]

Calc-Result

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A disk and cartridge based program which will answer all your financial and number crunching questions.



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Figure 1. The effect of the concentration of the solution on the adsorption of the dye. The concentration of the solution was 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 15.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0, 100.0, 150.0, 200.0, 300.0, 400.0, 500.0, 600.0, 700.0, 800.0, 900.0, 1000.0, 1500.0, 2000.0, 3000.0, 4000.0, 5000.0, 6000.0, 7000.0, 8000.0, 9000.0, 10000.0, 15000.0, 20000.0, 30000.0, 40000.0, 50000.0, 60000.0, 70000.0, 80000.0, 90000.0, 100000.0, 150000.0, 200000.0, 300000.0, 400000.0, 500000.0, 600000.0, 700000.0, 800000.0, 900000.0, 1000000.0, 1500000.0, 2000000.0, 3000000.0, 4000000.0, 5000000.0, 6000000.0, 7000000.0, 8000000.0, 9000000.0, 10000000.0, 15000000.0, 20000000.0, 30000000.0, 40000000.0, 50000000.0, 60000000.0, 70000000.0, 80000000.0, 90000000.0, 100000000.0, 150000000.0, 200000000.0, 300000000.0, 400000000.0, 500000000.0, 600000000.0, 700000000.0, 800000000.0, 900000000.0, 1000000000.0, 1500000000.0, 2000000000.0, 3000000000.0, 4000000000.0, 5000000000.0, 6000000000.0, 7000000000.0, 8000000000.0, 9000000000.0, 10000000000.0, 15000000000.0, 20000000000.0, 30000000000.0, 40000000000.0, 50000000000.0, 60000000000.0, 70000000000.0, 80000000000.0, 90000000000.0, 100000000000.0, 150000000000.0, 200000000000.0, 300000000000.0, 400000000000.0, 500000000000.0, 600000000000.0, 700000000000.0, 800000000000.0, 900000000000.0, 1000000000000.0, 1500000000000.0, 2000000000000.0, 3000000000000.0, 4000000000000.0, 5000000000000.0, 6000000000000.0, 7000000000000.0, 8000000000000.0, 9000000000000.0, 10000000000000.0, 15000000000000.0, 20000000000000.0, 30000000000000.0, 40000000000000.0, 50000000000000.0, 60000000000000.0, 70000000000000.0, 80000000000000.0, 90000000000000.0, 100000000000000.0, 150000000000000.0, 200000000000000.0, 300000000000000.0, 400000000000000.0, 500000000000000.0, 600000000000000.0, 700000000000000.0, 800000000000000.0, 900000000000000.0, 1000000000000000.0, 1500000000000000.0, 2000000000000000.0, 3000000000000000.0, 4000000000000000.0, 5000000000000000.0, 6000000000000000.0, 7000000000000000.0, 8000000000000000.0, 9000000000000000.0, 10000000000000000.0, 15000000000000000.0, 20000000000000000.0, 30000000000000000.0, 40000000000000000.0, 50000000000000000.0, 60000000000000000.0, 70000000000000000.0, 80000000000000000.0, 90000000000000000.0, 100000000000000000.0, 150000000000000000.0, 200000000000000000.0, 300000000000000000.0, 400000000000000000.0, 500000000000000000.0, 600000000000000000.0, 700000000000000000.0, 800000000000000000.0, 900000000000000000.0, 1000000000000000000.0, 1500000000000000000.0, 2000000000000000000.0, 3000000000000000000.0, 4000000000000000000.0, 5000000000000000000.0, 6000000000000000000.0, 7000000000000000000.0, 8000000000000000000.0, 9000000000000000000.0, 10000000000000000000.0, 15000000000000000000.0, 20000000000000000000.0, 30000000000000000000.0, 40000000000000000000.0, 50000000000000000000.0, 60000000000000000000.0, 70000000000000000000.0, 80000000000000000000.0, 90000000000000000000.0, 100000000000000000000.0, 150000000000000000000.0, 200000000000000000000.0, 300000000000000000000.0, 400000000000000000000.0, 500000000000000000000.0, 600000000000000000000.0, 700000000000000000000.0, 800000000000000000000.0, 900000000000000000000.0, 1000000000000000000000.0, 1500000000000000000000.0, 2000000000000000000000.0, 3000000000000000000000.0, 4000000000000000000000.0, 5000000000000000000000.0, 6000000000000000000000.0, 7000000000000000000000.0, 8000000000000000000000.0, 9000000000000000000000.0, 10000000000000000000000.0, 15000000000000000000000.0, 20000000000000000000000.0, 30000000000000000000000.0, 40000000000000000000000.0, 50000000000000000000000.0, 60000000000000000000000.0, 70000000000000000000000.0, 80000000000000000000000.0, 90000000000000000000000.0, 100000000000000000000000.0, 150000000000000000000000.0, 200000000000000000000000.0, 300000000000000000000000.0, 400000000000000000000000.0, 500000000000000000000000.0, 600000000000000000000000.0, 700000000000000000000000.0, 800000000000000000000000.0, 900000000000000000000000.0, 10000000

Handle Software, 5 Albert Road, Crowthorne, Barks, RG11 7LJ

A title like *The Complete Commodore 64* is a bold one. The 64 has a large repertoire of facilities and to try to include them all between two covers is a mammoth task. Granada have published many books on the 64 by various authors, and have now combined several edited versions into one weighty tome – just in time to capture the Christmas market.

The book is divided into 6 major parts, each one dealing with a particular subject. The first part is by Ian Sinclair from his book *Commodore 64 Computing*. I reviewed this particular work in the October '83 issue. I refer you to it for a detailed dissertation.

The 105 pages on Graphics and Sound is by Steve Money from his book of the same name. It describes character graphics, standard end programmable, including a PRINT AT simulation. High resolution graphics is clearly explained and a short machine code routine to clear the hi-res screen is provided.

The next part is about games, and is mainly from the *Commodore 64 Games Book* by the Bishops. I reviewed this in the February issue and my comments still apply. The games require a lot of work for little result. A few educational games have been included for good measure. I would prefer to have seen this section cut down in favour of a larger section on graphics and sound.

The editor of this compilation is Allen Scott. He and A Bradbury have written a book on adventures for the 64 and 40 pages of it are included. It is well written and entertaining, describing the origin of adventures and some of the techniques used when writing them. Short programming examples are provided and useful text 'crunching' routines are explained. I learned more from these 40 pages than a whole book on the subject from various other authors.

Part 5, Extending your Commodore 64, again by Allen Scott deals with joysticks, cartridges, other languages, disk drives, printers, speech synthesizers, light pens, monitors, modems and networks.

The final section is by Ian Sinclair but this time on the subject of machine code. He offers a sound introduction and does not claim to cover all aspects. Assemblers and monitors are described with particular emphasis on Supersoft's MIKRO 64 assembler package.

Several appendices offer lists of available software and suppliers, Hex to decimal converter, the 6502 instruction set and other odd fragments of information.

For £9.95 you get about five books rolled into one, although somewhat abbreviated. Each one

normally retails for between £5 and £7. It is excellent value for money and gives you the opportunity to sample the merits of several authors.

Ken Ryder

- The Complete Commodore 64
- by Allen Scott
- Granada
- £9.95
- Highly recommended, a good Xmas present.



More a collection of magazine articles than a text book, the sum and claim of the

'Screen Shot' series is step-by-step programming. Arranged in sequence, the articles go from absolute beginners right through to writing a simple arcade game.

These books are superbly produced and full of lovely colour. A novel feature is to use photographs of the monitor screen to illustrate examples and show listings – hence the 'Screen Shot' logo. But I found the listings difficult to key in. At 5 lines to the centimetre, the characters are very small and it's not easy to keep a straight edge in place.

Book 1 has the best Introduction to Sprites and Sound that I have yet seen, complete with a useful selection of sound routines – engines, lasers, birds and more, otherwise, it adds little to the manual that comes with your computer. Unfortunately the demonstration programs are unimaginative and slow.

The use of 'CHR\$ and even LET (on a Commodore) makes mountains out of several molehills – a hangover, presumably, of this being one of a collection of such series for various computers.

Book 2 is mainly, but not only, about graphics: including bit map graphics, drawing and filling shapes and more about sprites – both multi-coloured and animated. All this leads up to the usual task of writing a short arcade game. The game works but, written in simple Basic, it won't make a fortune for you in the arcades or software shops. A lot of useful stuff here but to follow the text, photographic listings and Mr. Cornes' individual style of programming takes plenty of patience.

Two books so far, and there are still two more to come – topics, as yet, unspecified. At £5.95 for each of these 64 page offerings,

this is an expensive, and not always easy, way of collecting some good information and ideas.

George Pike

- 'Screen Shot' Step-by-Step Programming for the Commodore 64, Books 1 & 2.
- by Phil Cornes
- Dorrington Kindersley
- £5.95
- The conclusion, lovely to look at, but, at the price, not very good value.

A personal voyage of discovery into your 'home computer', claims the front cover. Data Log is a work book to 'teach yourself' to program in simple Basic. Its spaciness and stardom theme are clearly aimed at the younger enthusiast. As well as explanations and programs to type in, there are squared grids on which to design and write your own ideas. All very clearly laid out.

After a short, but adequate, introduction to PRINT statements, the 'voyage' is launched into colours, the FOR...NEXT command, and graphics. Immediately after that, equipment for the Starship Quester must be designed and drawn out. The quick change variety arouses and then holds interest and enthusiasm. A welcome feature is the detailed, and regularly repeated, information on colour codes and screen locations – saves all that looking back.

By the time you've finished the book, most of the Basic commands, PEEK, POKE, keyboard graphics, strings, arithmetic, INT, RND, music, time and sprites have been covered – a comprehensive introduction to the 64. There are separate sections on editing and on error messages – but these are not as detailed as they might be.

There is one important grouse though. I spotted a few simple printing errors: for example, wrong line numbers and FOR T=1 TO 750: NEXT N. With experience, that's easy enough to sort out, but it's very confusing for the beginner – just who the book is meant for. Otherwise, an excellent, imaginative and fast moving introduction to Basic programming.

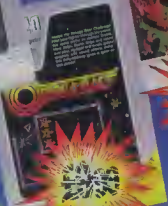
Teachers will find Data Log a useful starter book for classroom studies, with plenty of scope to suggest variations and improvements – especially in screen editing.

George Pike

- Commodore 64 Data Log
- by Roger Parkes, Nigel Green, Peter Johnson, and Colin Shearer
- Collins Software
- £2.95
- Good value for money. A sound, but fun, introduction to Basic – despite the silly mistakes

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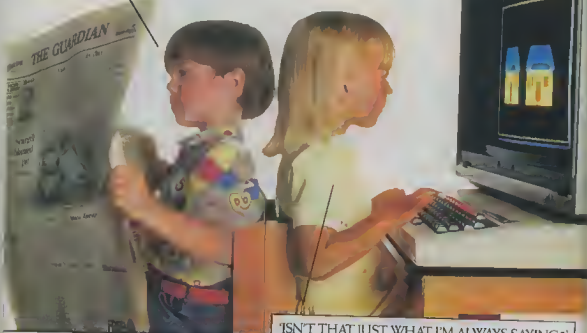
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Control your home with your Vic or 64

Chris Durham

Part four – getting 'feed-back' to your computer

So far in the series, we've looked at ways of getting your Vic or 64 to control external devices, simply turning things on and off at certain times. This month, Chris Durham explains how you can make your computer react to events as they occur. How about making your computer turn the lights on when you enter a room? But you'll need an input board – either make the one described or buy Handic's VIC-REL cartridge. Now read on...

What sort of input?

There are two types of input one can generate from sensors, analogue, such as a temperature measuring device, or digital, which is just on and off. For most purposes the digital signal is quite adequate since even a device like a room thermostat sends a digital signal: temperature above the limit (off) or temperature below the limit (on). Unless you want the computer to know the actual temperature there is no need to use an analogue sensor. The input board we'll build will therefore limit itself to 4 digital inputs both for simplicity and cost.

Although digital signals only have two states, there is also the element of time to be taken into account. A sensor might send just a quick pulse, or it might send a continuous signal when

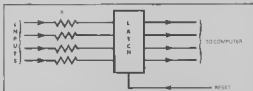


Diagram 1

on, such as the thermostat already mentioned. The board can be used with both types of input since it contains a 'latch', to store the input until the computer is ready to check the input lines. Equally important, it can be switched so that it only registers when an input changes from off to on and then ignores it so that it doesn't retrigger the computer until it has been reset. This is ideal for use with a security alarm, where you only need to trigger the alarm when a window or door is first opened and the

input line is then automatically reset as soon as the door is closed again.

The Theory

The block diagram of a simple input circuit with a latch is shown in diagram 1. This will register either a pulse or continuous signal and latch it until the computer has read the lines, then resets the latch. It suffers from disadvantages that the computer has to continuously scan the input lines to see if

there is anything there, and a continuous signal will keep being read even though it isn't giving any new information.

The circuit in diagram 2 (shown for one input line only for clarity) overcomes all these problems. Firstly the computer gets an interrupt signal to tell it to scan the input lines only when there is something to be read, and secondly, there is a circuit which can be switched in to ignore a continuous signal after it has been read once. Although it looks more complicated, there is very little difference in the cost or ease of construction between the two circuits. Diagram 3 shows the full PCB layout for the 4-channel input board, using the circuit.

When a voltage is applied to an input, the opto-isolator (ICI) is activated and the output of the relevant pin goes low (0). This is

continued on page 102 101

Project

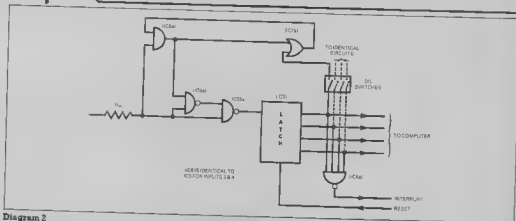


Diagram 2

inverted to a high (1) by the OR gate (IC2) which activates the latch (IC3). The latch then remains high until the computer has read the input, then a reset signal clears the latches on all 4 channels. IC4 is a 4-input NAND gate which sends the signal to the interrupt line of the computer (Flag 1) whenever an input occurs.

This can be tested for by checking the interrupt register to see if the FLAG interrupt bit has been set (bit 4 of 6C009). If you don't intend to use this line then the IC can just be left out of the circuit, it will not affect the working of the rest of the board in any way. ICs 3-8 are for the 'continuous signal hold' circuit which is activated by the DIL switches (SW1-4).

Building your own PCBs

Before we start, let's look at components and PCBs. The fact is that the resistors and capacitors used are not critical. You can get resistors from Maplin but both 0.4W metal film, and 0.5W carbon film are suitable. Capacitors are disc ceramics unless otherwise stated; the Maplin miniature range being ideal.

As far as making PCBs is concerned, Maplin supply a range of PCB making materials. I use the rub-down transfers rather than a pen, since I find that this gives a more professional look and enables tracks to be put closer together when necessary. Anyone making a PCB for the first time is advised to make a simple board first before attempting a more complicated design. Anyone but the DIY enthusiast can happily skip this section.

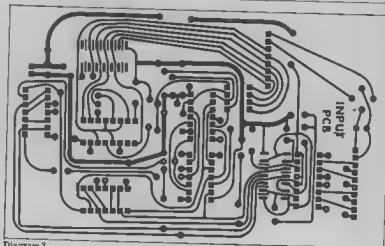


Diagram 3

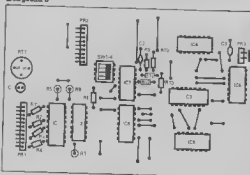


Diagram 4

The order of construction is as follows: IC sockets, DIL switch, wire links, resistors and capacitors and finally the plug connectors. Diagram 4 shows the component layout on the board. When you're happy that all the connections have been made correctly, clean up the board and drill the mounting holes (if you are fitting it in the same box as the output board then it can be mounted on stand-off connectors on the lower board). The last thing to do is insert the ICs, ensuring that you are at earth potential before handling the devices.

Solder the socket connectors

Constructing your board

The PCB is a little complicated since there are a number of ICs fairly close together. This means that extra care must be taken to avoid any shorting out between

tracks. Although it's not absolutely necessary to use sockets for the ICs, because they are CMOS devices I would recommend the slightly extra cost to avoid damaging them when soldering.

onto the wires as shown in diagram 5a and 5b. The use of sockets and plugs for connecting wiring is recommended, so allow the board to be removed should that be necessary. It is not vital however, and wires may be soldered directly to the boards for a more permanent connection.

The prototype input board was fitted into the same box as the output board shown in Part Two

of the series. Diagram 5c shows the connections to the switches and phono sockets next to the computer reset switch. The two switches enable circuits 3 & 4 to use the 9v power supply from the computer instead of an external power source. In the 'off' position the input circuit must supply its own power, but when on all you need is a wire with a switch (or similar on/off sensor) in circuit. The other two circuits must have

a 6-10v power supply, since to run all four circuits off the 9v supply might overload it. The inputs are polarity conscious so you must ensure that the power supply is connected correctly (positive to the contact marked +).

Testing the board

Connect the board to the computer, then power up. If the

computer does not power up as normal then switch off immediately and check the board for solder bridges or mistakes in the construction. Assuming all is well, type in the following short program and run it: (84 only - Vio details on request).

```

5 POKE 56576, PEEK(54576)
AND 247: REM SET SERIAL
ATN LOW
10 POKE 56579, 15: POKE
56577, 0
20 PRINT "-CLR-"
30 X = PEEK(56577) AND 240:
IF X = 0 THEN 30
40 PRINT "KOMR-"; X: POKE
56576, PEEK(54576) OR 6
50 POKE 56576, PEEK(54576)
AND 247: GOTO 30

```

When you generate an input, in the form of a voltage between the 0v connection and one of the input lines, then the computer should print a number on the screen. This will be 16, 32, 64 or 128 depending on which input is activated. Test each input in turn to ensure they all work correctly. The POKE in line 50 provides the 'reset' function to clear the latch after the input has been read.

Note that the SERIAL ATN line is being used to reset the latch. Since this is also used by devices on the serial port you must POKE 56576, PEEK(54576) AND 247 after every serial port access (not forgetting to set the bit before accessing the serial port or you will get a DEVICE NOT PRESENT error) it follows that no inputs can be read while a device is accessing the serial port (printer or disk drive etc)

Making your system work

Like most of the projects the use is only limited by your imagination. Diagram 6 shows a system, which automatically switches on the light when someone enters the room, then turns it off again when they leave. You will note that you need sensors (switches) which inform the computer that an action has occurred which needs a response. The computer checks what the response should be, in this case turning the light on or off, and then sends a signal to the relevant output channel. The sensor in this case could be a double 'interrupted beam' switch which (with suitable decoding) could tell the difference between someone entering or leaving the room. The computer would need to keep a count of the total people in the room and only switch off the light when the last person left.

For this sort of application the DIL switches on the input board

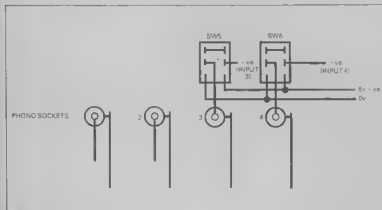


Diagram 5

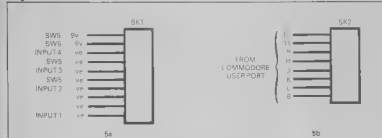
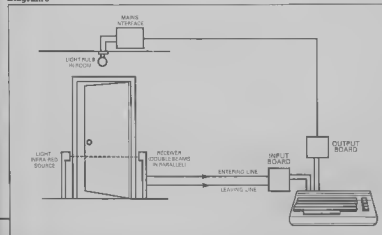


Diagram 6



Project

would be set to the OFF position, since we have an occasional signal which must always be registered.

If you were using the computer as a burglar alarm, as shown in diagram 1, then you only want to know when the alarm is first triggered. In this case set the DIL switch for the channel to ON. Because the input channels are totally independent, you can have both types of input on the same board merely by setting the appropriate DIL switch.

If you've been following the series so far, you will now be able to build a 4 input, 8 output system to control or monitor many of the functions of your home, should you be so inclined. These devices can just as easily be used to operate a small robot, control a model railway - or just let your imagination run wild. It's that ability to make a decision, based on the program facts, that makes computer control so much more versatile than just a straight relay wired to a switch. There's no room here for a sample program, but one that acts as a burglar alarm and 'house manager' is available to you free from Commodore User on request.

VIC-REL - a commercial unit

For those of you without the facilities to construct boards, VIC-REL provides a simple and convenient way to interface the outside world to your computer, costing £34.95. Although not as sophisticated as the constructional projects it can be used to good effect in conjunction with the mains interface unit or for low-power control. The unit consists of a standard Vic-20 size cartridge with extra connectors on the

front and back. The front connector plugs into the User Port on either the Vic or the 64, while the back connector is a strip of 20 screw terminals for connecting the wires. Included are a 5v power supply and a ground (0v) connection.

Outputs

The six output channels are just relay connections. When the computer activates the channel the relay contacts close completing a circuit. This means that you have to provide the power to drive the device from an external source such as a transformer or batteries. The relay contacts are only rated at 24v dc and a 250mA current. Therefore, before you can control any device, you need either a transformer or a relay of the appropriate voltage and current rating. The manual does explain all this, but does it at the back. I would rather have seen this at the front since most people are

notorious for not reading the manual fully before having a go.

There are six red LED pilot lights which indicate when the relay contacts are closed on each of the channels. This is a useful indication that the computer is working correctly before you actually connect anything onto the relay. If you want to use VIC-REL to operate the mains interface described in Part one of the series (Commodore User, September issue) then you can use the 5v output from the cartridge to operate up to 5 relays. Note however that because the mains interface uses negative logic you must reverse the instructions for switching the channels on and off given in the manual (ie turning the VIC-REL channel 'on' will turn the mains circuit 'off').

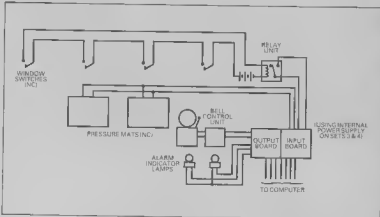
Inputs

The 2 input channels can be operated by any voltage between 5v and 12v, including the power

output from the cartridge. Both channels are fully isolated from the computer so there is no danger of damaging the computer even if there is a fault on the input lines. The user port register is read with a PEEK command to see if either of the lines are set, but there is no latch, if a signal appears on the input briefly between two PEEKs then it will be ignored. The input channel must actually be on when the computer reads it.

There are two LED indicators, green this time, so that you can again check that the system is working correctly. One point that might confuse some people is the input channels also work on negative logic, when 5-12v is applied to the channel, the green LED lights up, but the 'on' in the user port register changes to a 0; a 1 in the bit indicates a no-signal condition. Unfortunately, the manual has got the input numbers completely mixed up (unless the current manual has been amended). Input 1 gives a value of 128 and input 2 gives a

Diagram 1



value of 64, not the other way round as printed.

Conclusions

All in all, for £34.95 I found VIC-REL to be reasonable value for money. It does the job it is intended for, albeit without frills, and allows the non-constructor to play around with controlling external devices with a minimum of effort. Although you cannot control anything really useful without at least adding another power supply and some relays, it does what the appetite and show that computers do not have to be limited to games playing and letter writing.

Next Month Home Control expert Chris Durham reveals the new Sentinel computerised alarm system, the Vallant turtle, and news of a specially commissioned Home Control listing that you can write in for.

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Commodore's 1520 printer/plotter reviewed

by Chris Durham

The 1520 printer/plotter has been around for a while, but it's still the only plotting device that you can link easily to your Vic or 64. And the price is cheap too. It's gone down from £170 to £99.99, making it more of a tempting proposition for your Christmas stocking. But can a machine that uses ball pens and 4ins wide paper be capable of doing anything really useful? Chris Durham finds out.

Once upon a time, deep in the dungeons of Commodore Towers, there was a lot of plotting going on. Lots of multi-coloured symbols appeared on long, narrow pieces of paper. No, this wasn't an early bid to out the Chairman, but the Commodore bosses beavered away to produce yet another 'add-on' for their home computers. And so the 1520 was born, a combined printer and plotter, using four coloured ballpens (green, red, blue and black) mounted in a 'turret'. Commodore were not the first to produce such a device; others had beaten them to it for different machines, but Commodore saw the potential. For the first time, people buying a Vic or 64 could add on a device to give up to 80 column printing in colour, plus a drawing facility, at a price well below normal dot-matrix printers at the time.

Why a plotter?

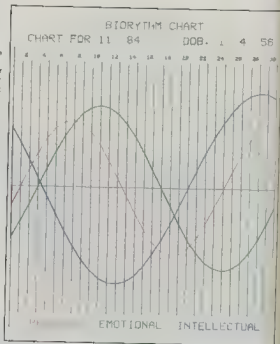
Until machines like the 1520 appeared on the market, plotters were large beasts used by major companies to produce maps,

diagrams and such like. Some smaller A3 plotters were available for business or scientific micros to draw stuff like graphs and charts, but these were still rather expensive. Home computer users were denied any sort of plotting facility unless they could write their own routines for a screen dump on to a dot-matrix printer; and even then it was strictly black and white.

The breakthrough came with the sudden decrease in computer ownership; at last there were enough people around who might just want a cheap machine that could draw lines and do printing, all in the same package. Suddenly, home computer users could draw graphs, plot equations, draw pretty pictures and generally do all the things they never even knew they had been missing.

1520 - the machine

The 1520 is a small machine measuring only 11ins wide by about 14ins deep, without the paper roll. The roll sits in the cradle at the back, rather like a life-boat between davies, and adds another 3ins to the depth. There is a removable cover on the top of the printer to allow access to the pen turret and to allow paper to be fed round the



The great co

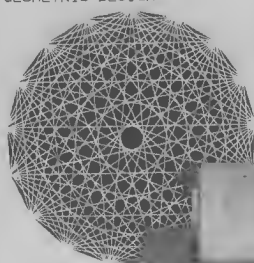
roller. The cover has a serrated 'tear-bar' included where the paper emerges, but while it does the job, the act of pulling the paper against it also tends to pull the paper through the rollers. The result, unless you are very careful, is a diagonal tear rather than a straight one - this is a minor niggle though, rather than a fault.

There are three controls on the front edge, plus the power-on indicator. The controls are (from the left) paper feed, colour change and pen change. The last of these allows you to insert and remove the pens from the turret, one pen at a time. When changing pens the turret moves to the extreme right-hand side of the carriage where there is a neat little bar that flicks the pen out of its holder. You then press the colour change button, the turret moves back to the left-hand side, changes the pen colour, then moves to the right for you to remove the next pen, and so on for all four - very neat, very clever.

It is recommended that you remove the pens and cap them when not in use, they are so small that they tend to dry out very quickly if left inside the plotter all the time. One complaint about the pens is the price, you have to buy a complete set of four pens at £5 a set, but it is often only the black pen that has run out of ink.

The internals of the machine are neat and well laid out. The print head and paper feed mechanism is all contained in the top-half of the case, connected by two sets of cables, one set connecting the switches to the PCB below. The power transformer is mounted inside the lower-half of the case on the right with a power switch and a

GEOMETRIC DESIGN



300mA fuse. On the left is the PCB which is uncluttered and well secured. There is a large heatsink between the PCB and the power unit and good ventilation, the machine did not get very hot even when left on for long periods.

The 1520 as a plotter

At the current price of under £100 you can't expect miracles. However, within certain limits the 1520 is capable of plotting almost any type of graph that can be expressed either mathematically or as a series of co-ordinate points. There are commands to move anywhere within the plot boundary relative to a fixed starting point, or relative to a temporary point (for example the last point plotted). The pen 'turret' moves along the X-axis and the paper is moved up and down in the Y-axis, both can occur simultaneously.

careful to ensure that the paper roll is partly slackened off to avoid any hint of tension.

I found that the first two or three plots were invariably ruined by paper slippage until the machine had warmed up. It is also advisable to 'roll up' as much paper as you are going to need for the plot and then rewind to the start point before you start the actual plotting. This must be done within the program since there is no manual 'backwards' feed on the machine.

Diagram 1 shows the type of plot that can be done - a



Colour is changed by rotating the turret so that the new pen is lined up at the same point as the old pen, the turret in fact moves off the plot to change pens and then moves back to the original position.

Because the paper is fed up and down by just two small pinch rollers pressing against the rubber platen, the paper can slip if there is any pull on it at all. The original 1520s had a cover over the paper, but this was later removed. I suspect because the paper would hit it and alter position when fed back. Even without this cover, you must be

example programs in the manual (which contained a major error as printed). There are many similar designs which can be drawn very easily. You can even try out your own 'patron maker' and experiment with the four different colours. You can plot dotted lines of varying ratios and even 'fill in' areas with colour, although since this must be done one line at a time it is rather laborious. Once you start using a plotter, you begin to find more and more uses for it as you become familiar with its capabilities.

computer plot

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SOFTWARE FOR ALL THE FAMILY

Available from Boots WH Smith, Spectrum and all good software stockists. Write for a free catalogue to Mirrorsoft, Holborn Circus, London EC1P 1DQ.

Your own characters

The Easy Way.

by George and William Pike.

'Vaders, zombies, greenies, munchies: bombs, bullets, mines and missiles. The armchair critics tell us we can have any graphics we want on Commodore computers, providing we want Clubs, Diamonds, Hearts or Spades: not true! not true! Design the characters you want and put them in your programs. No fuss, no sweat, no hassle: here's how. For both Vic and 64.

To start with, just type in the program from Table 1, note that some lines don't apply to both machines. On the 64 it's a good idea to SAVE before you RUN the program - one typing error can crash the computer and that means back to the beginning.

The next step is to RUN the program. With the 64 things will happen before your very eyes with the Vic nothing appears to happen, but in fact the computer is hard at it. PEEKing and POKEing from ROM to RAM. More of that later. In the meantime, just sit tight. After a while you'll see READY and the cursor, or an apology for it will appear. Type away and the computer seems to operate exactly as it did before. And so it does until you try some reversed characters. KVS '61 'A' and 'B' will produce the three characters in Table 3 (other reversed characters will produce garbage).

There's the basis for a program with your own characters. But a lot of memory has been used - no problem with the 64, but on the Vic there's only about 800 bytes left for your program (and just under 3900 with the Super Expander fitted). Not a lot, as Mr Daniels would say, but enough!

What if you want different characters to those in the table? Or say you want to save memory by copying only some of the 'switch-on' characters? Or your program calls for reversed characters, or upper and lower case letters? Read on or all is about to be revealed.

How do you choose the 'switch-on' characters you want?

First the bad news. As we are going to define some characters, we must define them all - at least all the ones we want. That

includes standard alphanumeric and your own brand new characters.

Now the good news. It is easy to pick and choose the characters to be defined. We can look (PEEK) into ROM where the computer keeps copies of its standard characters, and from there we can copy them (POKE) into RAM. This is what line 120 does.

With nearly 10K still available, 64 users can relax but Vichums will want to copy as little as possible. All that follows applies equally to both computers, however.

There are four sets of 128 characters stored in the computer's ROM - see Table 2. These are Set 1, the Upper Case and Graphics Set, in normal and reversed form; and Set 2, the Text Set (upper and lower case letters plus some graphics) again in normal and reversed form (that's the set you get if you press SHIFT and the Commodore key).

Where you PEEK in line 120 will decide which of the four sets are copied. The starting numbers for PEEK are

	Vic 20	C 64
Set 1 normal:	32788	83248
Set 1 reversed:	33782	84272
Set 2 normal:	34816	85296
Set 2 reversed:	35840	86320

In the Starter Program, line 120 will decide which of the four sets are copied. The starting numbers for PEEK are

Line 110 selects which characters from the set are to be copied. For example, try FOR I=8 TO 215. That simply selects the upper case letters from Set 1 of the lower case letters from Set 2 depending on the PEEK number in line 120.

Programs usually need at least some of the standard characters, so you'll copy those. Just pick

and choose to use the minimum amount of precious memory. Perhaps a program might need upper and lower case letters, numbers and some punctuation.

The first part of Set 2 (PEEK 34816 or 35826 accordingly) has all this. So you could use this:

```
110 FOR I = 8 TO 727
120 POKE 5120 + I, PEEK(34816 + I); NEXT
```

where 34816 is for Vic or 35826 for 64.

Or, if you still miss out some unwanted characters, those your

programs aren't likely to need those with POKE numbers from 33 to 43, say. Line 110 becomes FOR I = 8 TO 243. Line 120 is unaltered.

We also need to redefine some of the standard characters into your new shapes. So now we need two more lines for the second group of characters to be copied to add:

```
122 FOR I = 352 TO 727
Line 124 is exactly the same as line 120 so put the Cursor over line 120, change 180 to 124 and RETURN
```

Table 1: A Starter Program

	Vic-20	Commodore 64
	To set the computer up:	
100	POKE 51,255: POKE 52,19	POKE 53272, (PEEK(53272) AND 240) + 12: POKE
	POKE 55,255: POKE 56,19	52,48: POKE 56,48CLR
105		POKE 56334, PEEK(56334) AND 254: POKE1, PEEK(1) AND 251
	To copy the text characters out of ROM into RAM:	
110	FOR I = 0 TO 1023	FOR I = 0 TO 1023
120	POKE 5120+I, PEEK(32768+I): NEXT	POKE 12288+I, PEEK(53248+I): NEXT
125		POKE 1, PEEK(1) OR 4: POKE 56334, PEEK(56334) OR 1
	To put the defined characters into RAM:	
130	FOR J = 0 TO 23: READ A	FOR J = 0 TO 23: READ A
140	POKE 6144+J, A: NEXT	POKE 13312+J, A: NEXT
145	POKE 58868, 23	
	The last three lines are the same for both computers:	
150	DATA 24,60,60,24,255,255,66,66	
160	DATA 60,60,24,60,126,255,56,195	
170	DATA 0,16,24,28,31,28,248,18	

Being too fussy can mean the extra lines needed use up more memory than that taken by the characters left out. Please yourself: the possibilities are endless. Table 2 has the start and finish numbers for each character - in line 122 you go FOR the 'From' number of the first character in the group to be copied. To the number of the last character in the group.

Now to define our own characters

This is simple. Table 3 gives three examples. Each character is designed on an 8 x 8 grid.

Line 110 I Values

Line 110 I Values

To set the computer up:

To copy the text characters out of ROM into RAM:

To put the defined characters into RAM:

The last lines are the same for both computers:

(square) of squares. Simply shade in squares on the grid until the character you want is obtained - an eraser is a must! (All the 'switch-on' characters on the computer were designed in this way; this can be seen quite clearly by a close look at a large-screen Vic.)

Once the required shape is found, all that is needed is a simple addition for each line on the grid; it's just a binary-to-decimal conversion. The sums for the characters on Table 3 are shown on Table 3. The answer to that sum is the DATA value for that line to go in lines 150-170 - compare the underlined values on Table 3 with the DATA values in lines 150-170.

For clarity, the sample program has a separate line of DATA for each character. That's recommended, but the DATA items can follow on, on the same line until the line is full. There must be eight DATA values for each and every character to be designed.

Line 130 will be FOR J = 0 TO X, where X is less than eight times the number of characters being defined - hence 23 in the Starter Program, for three characters.

How do we 'work' our character?

Each defined character must be assigned to a particular key -

any key we choose - on the computer. This is done in Line 140.

As it stands, Line 140 puts the three characters into reversed 'Q', 'A' and 'B'. That means if you type RVS 'Q' or POKE 129 into a location, New Character 1 will appear on the screen. Similarly RVS 'A' and POKE 150, or RVS 'B' and POKE 131, will produce respectively the second and third characters.

It is not always convenient to use reversed characters in a program. Fortunately there are alternatives. For example, we can

put the characters into strings A line to do this might be:

```
180 AS = "[RVS ON] @ [RVS OFF]: BS = "[RVS ON] A [RVS OFF]: CS = "[RVS ON] B [RVS OFF]"
```

This is not a lot better. An alternative is to assign them to keys whose characters have not been copied. If they have in fact been copied, our defined characters will 'win', it will replace the character previously copied from ROM.

It is helpful to assign them to keys which follow each other in the POKE list, Table 2, and which are next to each other on the keyboard. The four graphics character keys at the end of the POKE list fit the bill - the ones you get when you hold the Commodore and SHIFT keys while pressing C, X, V and B. POKE 124, 125, 126 and 127 respectively are the numbers you need.

Unfortunately the 'C' and 'X' are the 'wrong way round'; but we can put up with this if we choose to put our three characters on to CBN/SHIFT 'C', 'X' and 'V', we must change line 140:

```
180 POKE char + J, A, NEXT
```

where char is 6112 for the Vic or 13280 for the 64 - 6112 is 5120 + 992; 13280 is 12288 + 992. 992 is the starting or 'from' number of the character at 124, CBN/SHIFT 'C' - the first of our three 'new' keys. This puts our three

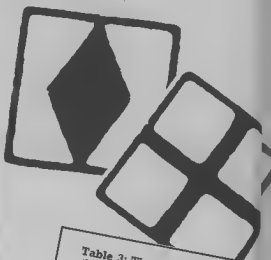


Table 3: Three user-defined characters and the DATA they need for Lines 150-170

Table 1



16+6=24
32+16+6+4=60
32+16+6+4=60
16+8=24
128+64+32+16+8+4=256
128+64+32+16+8+4+2=254
64+2=66
64+2=66



32+16+8+4=60
32+16+8+4=60
16+8=24
32+16+8+4=60
64+32+16+8+4+2=126
128+64+32+16+8+4+2+1=191
64+2=66
128+64+2+1=195



0
16=16
128+64+32+16+6=248
16+8+4=28
16+8+4+2+1=31
16+8+4=28
128+64+32+16+6=248
16=16

defined characters into the same part of RAM as our copied characters, and it dispenses with the need strings and RVS characters.

And now it's up to you

The characters are defined and copied. The time has come actually to write a program. Use the copied and defined characters as you wish, there are no limits, except for memory.

Once the characters are designed and their keys chosen, it is well worthwhile to write the main program first, that saves hours of time for the computer to PEEK and POKE every time the program is RUN.

It will look a bit odd if your Eakon or whatever is a black quarter square in one corner when programming; but provided you can remember what it's going to be when you RUN, so what?

Then you can use a GOSUB or GOTO or merge in some

previously saved lines to add the copying, defining and assigning lines as the finishing touch.

Whatever else you do, though, 64 users should SAVE the program before you RUN the 'character' parts, else all those hours of typing might turn out to have been in vain!

The program works with the unexpanded Vic or with a Super Expander or 3K cartridge added. It will not work with 8 and/or 16K expansion and we have yet to find the secret for this. Mastering the Vic tells us to raise the bottom of memory above the character matrix. Not only do we not know how to, we don't know what it means. Surely someone somewhere knows please tell!

Acknowledgement

There is barely an original thought in all this. It has been drawn from a variety of books and magazine articles and tips. To Hampshire, Tommy, Todd, Butterfield and all the rest of you who are thinking, "I bet they got that from my ...", we in turn would simply say, "We expect you're right. Our grateful thanks!"

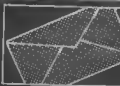
Happy programming. It works; we have no idea why, but it works!

Table 2: Address values to copy 'switch-on' characters from ROM to RAM

Line 110 I Values					Line 110 I Values				
SET 1	SET 2	POKE	From	To	SET 1	SET 2	POKE	From	To
0	a	1	9	15	1	A	64	512	819
1	a	1	9	15	2	A	65	520	527
2	a	1	9	15	3	A	66	528	535
3	a	1	9	15	4	A	67	536	543
4	a	1	9	15	5	A	68	544	551
5	a	1	9	15	6	A	69	552	559
6	a	1	9	15	7	A	70	560	567
7	a	1	9	15	8	A	71	568	575
8	a	1	9	15	9	A	72	576	583
9	a	1	9	15	10	A	73	584	591
10	a	1	9	15	11	A	74	592	599
11	a	1	9	15	12	A	75	600	607
12	a	1	9	15	13	A	76	608	615
13	a	1	9	15	14	A	77	616	623
14	a	1	9	15	15	A	78	624	631
15	a	1	9	15	16	A	79	632	639
16	a	1	9	15	17	A	80	640	647
17	a	1	9	15	18	A	81	648	655
18	a	1	9	15	19	A	82	656	663
19	a	1	9	15	20	A	83	664	671
20	a	1	9	15	21	A	84	672	679
21	a	1	9	15	22	A	85	680	687
22	a	1	9	15	23	A	86	688	695
23	a	1	9	15	24	A	87	696	703
24	a	1	9	15	25	A	88	704	711
25	a	1	9	15	26	A	89	712	719
26	a	1	9	15	27	A	90	720	727
27	a	1	9	15	28	A	91	728	735
28	a	1	9	15	29	A	92	736	743
29	a	1	9	15	30	A	93	744	751
30	a	1	9	15	31	A	94	752	759
31	a	1	9	15	32	A	95	760	767
32	a	1	9	15	33	A	96	768	775
33	a	1	9	15	34	A	97	776	783
34	a	1	9	15	35	A	98	784	791
35	a	1	9	15	36	A	99	792	799
36	a	1	9	15	37	A	100	800	807
37	a	1	9	15	38	A	101	808	815
38	a	1	9	15	39	A	102	816	823
39	a	1	9	15	40	A	103	824	831
40	a	1	9	15	41	A	104	832	839
41	a	1	9	15	42	A	105	840	847
42	a	1	9	15	43	A	106	848	855
43	a	1	9	15	44	A	107	856	863
44	a	1	9	15	45	A	108	864	871
45	a	1	9	15	46	A	109	872	879
46	a	1	9	15	47	A	110	880	887
47	a	1	9	15	48	A	111	888	895
48	a	1	9	15	49	A	112	896	903
49	a	1	9	15	50	A	113	904	911
50	a	1	9	15	51	A	114	912	919
51	a	1	9	15	52	A	115	920	927
52	a	1	9	15	53	A	116	928	935
53	a	1	9	15	54	A	117	936	943
54	a	1	9	15	55	A	118	944	951
55	a	1	9	15	56	A	119	952	959
56	a	1	9	15	57	A	120	960	967
57	a	1	9	15	58	A	121	968	975
58	a	1	9	15	59	A	122	976	983
59	a	1	9	15	60	A	123	984	991
60	a	1	9	15	61	A	124	992	999
61	a	1	9	15	62	A	125	1000	1007
62	a	1	9	15	63	A	126	1008	1015
63	a	1	9	15	64	A	127	1016	1023

Letters Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think - about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.



Colour change

I'm glad to see you have initiated a regular adventure column. This makes your already excellent magazine even better.

In the October adventure column you complained about the shortcoming of some text adventures having blue text on blue background, and mentioned the Infocore titles as major offenders. Of course, it isn't possible to incorporate your basic colour-change subroutine in Infocore adventures; nevertheless, producing a better colour combination for these adventures is a simple procedure. Before loading, type:

POKE \$3288,X
POKE \$3281,X
POKE #44,Y

Where X is the code for your desired background colour, and Y is the code for your character colour: my own preference is for yellow text (Y=7) on a black background (X=0), although black on yellow is good as well.

You can follow a similar procedure to alter the screen appearance of Level 9 adventures, but can only alter the background colour. Still, light blue on black is much better than blue on blue. Keep up the good work.

Paul Felchman, 49 Kingsleigh Road, Heston, Merton, Stockport SK4 3PP.

Wearing Ribbons

Dear Sir, In your October issue you published a letter from R.G. Holmes saying that, in view of the cost (£6.80) of buying a new ribbon for his 1511 CBM printer, he was interested to read that the MPS-801 printer has an already replaced inkbar.

Do not be too jealous of an MPS-

801 owner: Mr Holmes, although, in theory, the inkbar is easily replaced in the ribbon cassette, there are some available (at least in this part of England). All the shops I have tried tell me the same story, that they have had orders on order from Commodore since the Printer went on sale but they cannot get any delivered. Strangely enough there are plenty of cassette computers with inkbar available at a cost of £9.95, although why Commodore should expect 801 cassette to require replacement before they run out of ink is a mystery to me.

Like Mr Holmes I have devised my own low-cost solution to the problem, rather than by coping into buying a new cassette with same the ink new out. It only takes a few minutes and costs a few pence to refill an inkbar using my method. Here it is, for others who have the same trouble:

- 1) Buy two cheap ball-point pens costing a few pence each and remove the ink tubes from the cases.
- 2) Did a small hole in the end of the inkbar remote from the inkpad.
- 3) Insert the open end of one of the ink tubes into the hole and squeeze the ink into the inkbar by sliding a pair of pliers or tweezers down the tube.
- 4) Repeat (2) with the other ink tube.
- 5) Repeat the inkbar using blackest or any other suitable ink.

If the ink-pad has become very dry, it may take a few hours before the ink works through the pad on to the ribbon and thence to the paper; the process can be speeded up by adding a drop or two (no more!) of methylated spirits to the ink before inserting the inkbar.

Take care when handling the ink tubes and the inkbar as the ink will mark most surfaces (even hard plastics) and it is difficult to remove. If you do get ink where you don't want it, do not try to remove it with water; wipe up with a rag or paper towel soaked in "Dettol" or "Dettol" or "Dettol".

D.I. Delginich, 56 Fethorne Road, Southgate, London N14 7DA.

D Delginich points out that his letter was printed using the above method, and it looked

just fine. But he warned: printer manufacturers claim that ribbons are impregnated with special ink and that re-loading them may cause the dye residues in your print head to become blocked.

The Other Side

Scarcely a month goes by without someone rediscovering that if you cut a second write notch in a floppy case, you can force it over and use it. Most editors point out that single-sided disks have failed the production test on one side and therefore there is a risk. But there is really a far more serious danger than this.

If you turn a disk over in a single-sided disk unit it gets rotated in the opposite direction inside its cover. This means that while you are using the floppy disks, dust and debris which has been carefully swept up and released by the fibres on the inside of the case, are now not only shaken out on to the 'A' side again, but because of the 'A' side of the fibre pile, they are actually in a situation where they may be forced into the sensitive surface. You may get away with it, but you run the chance of wrecking the formatter.

Double-sided disks are only available in one direction and have read/write heads on both sides.

Reginald A. Masall, The Chilterns, Newton, Thamesbury, Bristol BS12 1LF.

Look Back In Anger

I would like to make the following points regarding your review of our Flight Simulator which appeared in the October issue, and in particular answer criticisms by Chris Durham.

The purpose of the grid in this program is to indicate the relative screen positions of the aircraft and airports for subsequent use when playing the program. Moreover, the significance of this grid is nearly diagrammatical and does not affect your operation of the program. For further releases see page 93 of this Commodore User Guide. However, there is no need to use the

grid at all if you call up the map during play and load your aircraft in the direction of whatever airport you choose.

With regard to the two 'bogs' Chris Durham experienced, may we deal with the problem of the undercarriage first. The program was written in the manner that the undercarriage takes two seconds to operate and stop and if the key is depressed twice, or the joystick not centred, the undercarriage will indeed go up and down in different parts of the program. Therefore, please make sure that the 'G' key is pressed once and left to do its work in due course.

We feel that in his excitement to land the aircraft, Mr Durham fell into the obvious trap of flying too low, too slow. The program is written to make the aircraft move under these conditions and a further attempt to land is then necessary. In order to avoid the speed-aid and attempt a second landing, it is possible to remove the restriction by immediately applying maximum power with the joystick in the climb position. May we suggest that he tries landing again this time keeping speed over 300 knots as requested by the prompt screen to reduce speed.

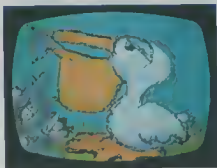
Finally, may we add that the plane is not slow to land, but of course it can be done. We felt that if we made it any easier, it would detract from the enjoyment of the game.

Angela Johnson, Anger Productions, 14 The Oval, Bromley, Northfleet Kent EN10 6QQ. Tel. Huddersfield (0482) 441156.

Angela Johnson also informs us that Chris Durham reviewed an early Mark I copy of Flight Simulator. The latest Mark 3 version has an improved view through the window, with the horizon changing when you bank. There is also a view of the runway upon landing.

Send your letters to:
Write Away,
Commodore User,
30/32 Farrington Lane,
London EC1 3AU.

CREATE SUPER VIDEO GRAPHICS



Menu selections on the screen can be conveniently displayed while the graphic is being created. In this way, the user will not lose sight of the drawing by constantly switching back to the menu as in most touch pad products. For exhibiting or reproducing your completed graphic, the menu and cursor can be eliminated from the screen with the touch of a button.

The "Expert Menu" adds a variety of computer automated features such as circles, boxes, rays, lines, and copy among others. A "Files Menu" allows the user to save pictures and retrieve them from a stored data bank. This command supports disk and tape storage.



£59-95

FOR THE CBM 64

Until now, creating computer graphics in colour has been both a demanding and expensive endeavour. The "Super Sketch" Graphics Tablet provides a totally unique and simple medium for creating video graphics at a surprisingly low cost.

By simply moving the stylus control arm, as you would a pencil, Super Sketch reproduces the movement on the video screen. Four control buttons at the top of the tablet assist in operating the graphic functions of the software. Graphics may be created by "free hand" or by "tracing" from drawings clipped to the pad.

Compared with other computer graphic products, it is much easier to use than keyboard controls, does more than joysticks, paddle controllers and mouse controllers, and is less expensive than touch pad products.



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Included in each package is all you need to create super graphics. A software cartridge is included in each package along with the Super Sketch controller pad (as described on the package). Also included is a comprehensive instruction manual and a "Starlet Kit" that consists of several drawings that can be traced from the pad.

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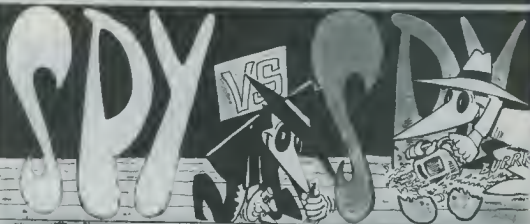
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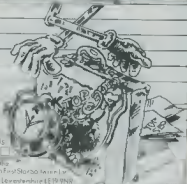
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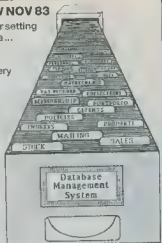
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TOMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wodge of priceless information and indispensable advice. There's even the odd useful tip as well!



Dear Tommy, I am at the end of my tether. It seems that I am totally unable to get an answer from Commodore to my problem.

I have a Vic-20 and a Brother CE50 Electronic Daisywheel Typewriter plus its IF50 interface and its CA50-S cable set (the machine accepts RS232 or Centronics). The lead has a 'D' 25 pin plug which the Vic-20 does not. How do I use the Vic-20 to drive my word processing equipment? I have Vicwriter and Disk Util. Why don't Commodore tell us more about the RS232 ability of the Vic-20, or is it all a sticky lie?

Please don't throw up your hands - please help me.

One of the most common problems I get asked about is how to connect two different manufacturers' equipment together so that they work as expected. The most pertinent piece of advice I can give is do not buy any equipment made by different manufacturers without:

- asking for a demonstration that the equipment is compatible and
 - without making it a condition of sale that equipment X must be capable of working with computer Y when used with interface Z.
- Failure to do either will almost certainly ensure that you are going to have problems at some stage. Even the so-called 'standard' RS232 interface has a number of variations, any one of which can prevent the two pieces of equipment from working straight away. Having

spoken to a supplier of electronic typewriters I suggest you try the Stack RS232 interface at around £55 (the cheaper interface at £26 will not work apparently).

Unfortunately Vicwriter will not work with an RS232 printer connected to the User port so if you intend using that, you will have to go for one of the serial-port to Centronics parallel converters such as the Viscprint from Ram Electronics. I have not tried this combination, but see no reason why it should not work; however, before you order note the points I made at the start so that you can return it if it doesn't work!

Dear Tommy, I would like some information to help me use my Vic-20. Please could you tell me how many modes I have and how to get into a different mode? Also I would like to know what the function keys and Commodore key do. If you could send me this information I would be grateful.

I assume you are talking about 'modes' a la BBC? In which case the answer is ONE! You cannot set different screen widths or resolution by a simple command because Commodore Basic has not progressed since the days of the old Pet. However, all is not lost since there are ways of getting 'Hi-res' modes but these all involve a clear understanding of how they work and the amount of memory that has to be set aside before you can use them. The different modes available are

1. Standard 28 col text and/or Commodore graphics (low-res);
2. Hi-res graphics mode
3. Multi-colour graphics mode

Many of the programs published in the magazine will give you an idea of using hi-res modes but the easiest way is by using the Super Expander Cartridge from Commodore which gives you those elusive 'Mode' commands and allows plotting commands directly from Basic.

The function keys also do not have any real use without going into machine code programming unless you buy one of the cartridges which allow them to be set to pre-set strings such as the Programmers Aid cartridge. They can of course be 'read' like any other key with a GET AS, which will return a value between 133 and 140.

Lastly, the CBM key is used in conjunction with the SHIFT key to change between upper and lower case letters plus restricted graphics set. It is also used as a 'control' key by a number of applications programs such as word processors. If you wish to test if it has been pressed during a program then address 653 will contain the value 2 while the CBM key is actually being pressed (or 3 if the SHIFT key is pressed at the same time).

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Dear Tommy, Please tell me how to make eight different sprite characters appear on the TV screen, at once. Every time I try, I get duplicate copies of the first sprite's data, the computer won't 'read' the second, third, etc. sprites of data.

I use a 'sprite builder' tape by Euro-Byte; could this have something to do with my problem?

Also is it possible to create more than eight sprites?

What you have to do after creating your sprites is to tell the computer where to find the information. The Sprite Data Pointers are the registers you need to set and these are at addresses 2040-2047. Each of these addresses must be set to the location of the first byte of data for your sprite, for example, if the data for sprite 0 is held from 12288 to 12350 then POKE 2040,192 will set the data pointer (12288+64 = 192).

The next sprite will be stored from 12352 to 12414 and its pointer will be set by POKE 2041,193, and so on... What has happened in your case is that you appear to have set all the sprite data pointers to the same value. Hence you get all the same sprites; whether this is caused by the Euro-Byte program I have no idea since I haven't seen that one. If when you set up the different sprites you can display them individually and the problem only occurs when you transfer the data to your program then you will need to find out where the sprite information is being stored in memory and set the data pointers accordingly. As for creating more than eight sprites, you can store the data on as many as you like (memory permitting) although the data must be in the same 16K 'page' of memory as the screen area. The limitation is that without using machine code and interrupts you cannot display more than eight at a time since there are only eight sprite data pointers.

Dear Tommy, I have a few questions concerning Commodore's 1520 printer.

pletter. Can the printer print user-defined graphics? If so, how can this be done? Is it possible to print the Vic-20's character set? If so, how can it be done? Which word processor supports the 1520? (If any). Thank you.

The 1520 printer/plotter can only print the alpha-numeric characters that are contained in its ROM. This does not mean that you cannot send down the codes to actually draw the characters you require, but it is not possible to download these on memory to the plotter for printing later on in the program, there is no RAM in which to store such characters. The way to do it is to design your characters on paper, working out the plotter movements required to draw them. These can then be stored (on disk or tape) and loaded into a multi-dimensional array for each program that needs to use them. You would then require a sub-routine which would pass the commands for the particular character to the plotter as a series of co-ordinates to be plotted.

I assume your second question refers to the Commodore graphics characters, in which case the answer is no; these characters are not included in the ROM based character set. If you try to print control codes for example, you will merely get underlined characters (pages 42/43 of the plotter manual refer to this).

Finally I don't know of any wordprocessor which supports the 1520. One of the reasons for this is that the device number is not that of a normal printer; most printers are set up as device 4 on the serial bus, whereas the plotter is set up as device 6. Any normal command to the printer will be totally ignored by the plotter. I am afraid that if you want to use a WP program you will have to invest in a standard printer

Dear Tommy, Can you tell me, please, whether a Commodore 64 made for the U.S. market can be used in this country? I bought a Commodore 64 in Seattle, and brought it back here; that it won't work with a U.K. television set I've already discovered, but would there be any problem with a colour computer monitor? Any help with this would be greatly appreciated, as I would prefer not to have to buy a whole new computer! Some method whereby I could interface my 64 with a U.K. monitor would be ideal. Also, could I use cartridges with my US machine?

I am afraid that you have more than just a problem with a UK TV. For a start the power supply transformer will work on 115V, not 240V as in this country. Therefore do not attempt to plug the machine in using the existing transformer otherwise you will do irreparable damage to both it and the transformer. You can always try contacting Commodore to purchase a new power supply, although they are not noted for their willingness to supply such items separately; alternatively you could buy a step-down transformer to convert 240V to 115V.

Even then you have a second problem of timing. The US machines use a 60Hz tuning signal, UK machines use 50Hz. This means that your machine will run slightly slower than normal, this is a minor problem for most applications however, unless you have a critical timing application. There is no reason why a colour monitor will not work, although you may again get slight problems from the timing difference. Finally, cartridges are universal and will operate happily on your machine, provided you can overcome the more fundamental problems.

Dear Tommy, I have one or two questions on the "health" of my Vic 20 and Datamaster. The power transformer heats up quite a lot. Is any damage possible from this overheating? Will my Vic be damaged in any way when the power transformer gets hot?

When a program has been loaded and the wheels stop turning round, but "play" button is still down, is any damage done to the Datamaster?

Now I have been having some more trouble with my Datamaster or Vic. Only some programs load. Cartridges work, though. For example, *Charlot Race* (Micro Artics) and *Tank Commander* (Creative Sparks) won't load, but *Charlot Race* sometimes will load, but this is very rare. All *Astroid* games and *Llamasoft* games will load, every time. That goes for *Tornado* (Q&S) too. Why is this so? I've cleared the "heads" on my Datamaster. I tried *Tank Commander* in the shop and at a friend's house. It worked then. Now I don't feel I can go out and buy a game, in case it won't load. Unless it's by *Astroid* (which produce very good games actually).

Finally, can all programs needing 8k expansion use 16k expansion? Had could you tell me where the screen codes and

screen colour codes begin and end on a 16k expanded Vic.

The simple answer to your damage question is no. However, if the transformer gets too hot to touch then this could indicate a fault, in which case you should return it to your dealer for checking. If it is just very warm then this is quite normal and no damage will occur. You should always ensure that you unplug it when you have finished with the computer though and not leave the transformer plugged in all the time, this can eventually cause it to fail.

The *PLAY* button on the cassette recorder can stay down without damage since the computer will turn the motor on and off as required. You should not leave the machine in this state when you have finished using it however, since this will cause distortion of the punch roller and upset the tape speed.

You don't say how old your cassette is. I know of a number of people who have similar problems with the 'old-style' cassette. If yours is fairly new, then it could be the tape head alignment. If the programs you have saved yourself all load correctly, but some commercial ones don't, then see if your dealer will check out the head alignment and tape speed for you.

Finally, all programs that need 8k should run without problem using 16k; the screen and colour maps relocating at 4096-4607 and 37888-38399 respectively.

Dear Tommy, The other day I set about composing a program which had a timing element within it. I wanted the time to be shown to 2 decimal points, i.e. hundredths of a second. The following program is basically what I used:

```
10 PRINT"CLR"
20 T=0
30 PRINT"HOME"
40 T=T+.01
50 GOTO 30
```

On running the above program you can see the problem that I encountered. Please could you explain why this occurs, and how to remedy it.

You are suffering from a common ailment, called 'floating point inaccuracy'. Because floating point numbers are stored in binary format there is a limit to the size of fraction that can be held accurately, hence some numbers suddenly go a few thousandths higher or lower. The way to overcome the problem is not to store the number as a fraction, but store an integer

value and then divide by 100 when you print it. Change lines 30 and 40 as follows:

```
30 PRINT"HOME"
40 T=T+1
```

Dear Tommy, Could you please tell me a little about integers and how they work as I don't know how, where and when to use them. I own a Vic-20. Thank you.

Basically, 'integers' is just another way of saying 'whole numbers', that means numbers without any fractional part. Commodore computers always store numbers in a floating point format and then convert to integer if required. If you have a number which has a fractional part, for example 2.3, then converting it to integer (using *INT(2.3)*) will give the answer 2. As to how when and where, it really depends on what you are trying to do.

If you store numbers in integer variables, for example *DIM A*, then you are in fact wasting time since there is a double conversion every time you access the variable. However an integer variable only occupies 2 bytes, whereas a floating point number occupies 5 bytes. Therefore if you are trying to cram a program into an unexpanded Vic-20 then using integer variables whenever possible will save space especially in array declarations. *DIM A%(5,5,5)* takes 250 bytes, *DIM A(5,5,5)* takes 625 bytes! If memory size is not a problem then stick to floating point variables for that little extra speed.

You are also limited to the values -32768 to +32767 in an integer variable (16 bits) whereas a floating point variable can store a much larger number.

Another use for integers is checking whether you have reached a certain multiple, within a loop for example. The following short piece of code will print 4 numbers across the screen before going on to the next row. It uses the fact that *INT* strips off the fractional part to thus if you multiply the result by the same number you divided by, you only get the same number when it can be divided an exact number of times. Try running this simple program:

```
10 FOR A=1 TO 16
20 PRINT A
30 IF INT(A/4)*4=A THEN
PRINT
40 NEXT A END
```

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Commodore User is published twelve times a year by EMAP Business and Computer Publications Ltd.

Subscriptions and Back Issues are handled by S.K.T. Subscription Services, Oswestry, Works, Douglas Road, Llanbridge, Kew, NW9 2ES. Telephone 0732 051210.

Annual subscription (UK) \$12.00 (Free) GRL 17.00 (Europe) \$18.00 (Rest of the World) \$32.00.

Printed by Gamod & Lathouse Ltd, Crawley, Photocasting by PDQ, London N10, telephone 01 444 0359, Reproduction by Ekan Litho Ltd, London EC2. Distributed by Associated Newspapers.

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